RESEARCH, DEVELOPMENT AND ENGINEERING COMMAND – SIMULATION TECHNOLOGY CENTER, PROGRAM EXECUTIVE OFFICE - SIMULATION, TRAINING AND INSTRUMENTATION
AND
ARMY RESEARCH INSTITUTE

BROAD AGENCY ANNOUNCEMENT
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ISSUE DATE: 01 March 2001
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(Or Until Superseded)

AMENDMENT 4 SUMMARY OF CHANGES

Pagination of this document has been realigned to accommodate Amendment 4 changes.

I. Introduction

There has been no change to this portion of the document.

II. Part I – Research Interests

1. Battlefield Simulation Research

Deleted Topics:
1-H. Individual Virtual Environment Technologies (IVET)

Updated Topics:
1-B. Distributed Simulation Environments & Interoperability
1-C. Logistics and Combat Service Support M&S Technologies
1-D. Synthetic Environment Data Modeling, Interchange, Access, and Reuse Development Effort
1-E. Rapid Construction of Urban Terrain Databases
1-H. Objective Force Experimentation
1-K. Medical Modeling and Simulation
1-L. Web-based Collaborative Training Environments
1-M. Embedded Simulation & Training
1-N. Virtual Individual and Collective Training for Dismounted Objective Force Leaders and Soldiers

2. Training Device and Simulator Research

There has been no change to this portion of the document.

3. Instrumentation, Targets and Threat Simulators Research

There has been no change to this portion of the document.

4. Test and Evaluation Research

There has been no change to this portion of the document.

5. Wargaming Research

Topics were updated with new Points of Contacts information.

6. Training Systems Research

Deleted Topics:
6-B. Training Systems Evaluation Research

Updated Topics:
6-A. Instructional Technology
6-B. Training And Performance Measurement For Digital Networked Military Units
6-C. Objective Force Training Methods

7. Collision Avoidance Demonstration
There has been no change to this portion of the document.

8. Additional Research Interests
There has been no change to this portion of the document.

III. Part II – Proposal Preparation and Submission
There has been no change to this portion of the document.

IV. Part III – Proposal Evaluation
There has been no change to this portion of the document.

V. Part IV – Cooperative Agreements
There has been no change to this portion of the document.

VI. Part V – Proposal Forms
Updated to include the latest clauses.

VII. Appendix A
There has been no change to this portion of the document.

CONTENTS

INTRODUCTION

This is the consolidated Research Development and Engineering Command – Simulation Technology Center (RDECOM-STC), Program Executive Office - Simulation, Training and Instrumentation (PEO-STRI) and Army Research Institute for the Behavioral and Social Sciences (ARI) Simulator Systems Research Unit Broad Agency Announcement (BAA) issued under the provisions of paragraph 6.102(d)(2) of the Federal Acquisition Regulation, which provides for the competitive selection of research proposals. Contract(s) based on responses to this BAA are considered to be the result of full and open competition and in full compliance with the provisions of PL 98-369, "The Competition in Contracting Act of 1984."

RDECOM-STC, in conjunction with PEO-STRI and ARI and through the Naval Air Warfare Center Training Systems Division (NAVAIR-Orlando TSD), contracts with educational institutions, nonprofit organizations, and private industry for research in those areas covered in Part I of this BAA. Proposed efforts should address issues in all domains including Advanced Concepts and Requirements (ACR) and Research, Development and Acquisition (RDA). Contractors are urged to consider cost sharing schemes in cooperation with RDECOM-STC. Details of a Cooperative Agreement are provided in Part IV of this document. Awards as a result of this announcement may take the form of a contract, a cooperative agreement or other transactions.

Funding of research within RDECOM-STC, PEO-STRI, and ARI areas of interest will be determined by funding constraints and research priorities set during each budget cycle. Therefore, those contemplating submission of a white paper are encouraged to contact the RDECOM-STC/PEO-STRI/ARI Coordinator, identified on the next page of this BAA (unless the technical point of contact is noted at the end of the technical area entry,) to determine whether the research warrants further inquiry. If the research warrants further inquiry and if funding is available, then submission of a proposal will be entertained. The recommended four-step sequence is: a telephone call**,** informal **two to four page** white paper, proposal (upon request from the Contracting Officer) and contract award for selected projects. This sequence allows earliest determination of the potential for funding and avoids contractor and Government time spent on efforts that may have little chance of being supported. (Note: Calling the technical point of contact (noted at the end of technical entry) is encouraged, but once submission of the white paper is suggested, then a call to the RDECOM-STC/PEO-STRI/ARI Coordinator, (noted on next page) is encouraged to complete the process.

This BAA consists of five parts as follows:

Part I - Research Interests
Part II - Proposal Preparation and Submission
Part III - Proposal Evaluation
Part IV - Cooperative Agreement
Part V - Proposal Forms

THOSE SUBMITTING PROPOSALS ARE CAUTIONED THAT ONLY A CONTRACTING OFFICER CAN OBLIGATE THE GOVERNMENT TO ANY AGREEMENT INVOLVING EXPENDITURE OF GOVERNMENT FUNDS.

This BAA (with amendments) shall remain in effect until 01 March 2006 or until superseded.

RDECOM-STC/PEO-STRI /ARI points of contact

The RDECOM-STC Coordinator for Simulation, Training and Instrumentation Research is Mr. Mark J. Stoklosa, Principal Investigator, who may be reached at (407) 384-3928 or email, mark.j.stoklosa@us.army.mil.

The PEO-STRI Coordinator is Mr. John Collins who may be reached at (407) 384-3840 or email, John_Collins@peostri.army.mil.

The ARI Coordinator for Training Systems and Evaluation Research, and Individual Combatant Simulation is Dr. Bruce Knerr who may be reached at (407) 384-3987 or e-mail, Bruce_Knerr@peostri.army.mil.

The contracts POC is Mrs. Vanessa Dobson who may be reached at (407) 384-4348 or e-mail, Vanessa_Dobson@peostri.army.mil.

If, as a result of the telephone contact, the research effort is determined to have sufficient interest, an informal white paper outlining the proposed effort should be submitted to one of the following individuals:

US Army RDECOM
Simulation Technology Center (STC)
ATTN: Mr. Mark J. Stoklosa
12423 Research Parkway
Orlando, FL 32826-3276

US Army PEO-STRI
ATTN: Mr. John Collins
12350 Research Parkway
Orlando, FL 32826-3276

ARI
ATTN: Dr. Bruce Knerr
12350 Research Parkway
Orlando, Fl 32826

Contractors preparing a White paper for submission may follow any convenient format desired. Typical White Papers are 2-4 pages in length as needed to convey the concept in simple terms with some data relating the estimated cost and schedule.

A review of white papers by government engineers will determine which efforts are of sufficient interest to merit a formal proposal. If there is sufficient interest in a proposed research project, the contracting officer will invite the offeror to submit a formal proposal. **All proposals, written communications, or documentation concerning this BAA shall be forwarded to the following address:**

NAVAIR Orlando TSD
TSD 25353 - Mrs. Vanessa Dobson, Contracting Officer
12350 Research Parkway
Orlando, FL 32826-3275

Proposals submitted in response to this BAA may be for a period of performance up to three years. (Such long-term proposals should contain a brief summary of the work contemplated for each 12-month period, so that contracts may be negotiated for an entire three-year project or for individual one-year increments of the total project). A detailed performance schedule for each discrete task must be included along with cost data to include labor by labor category.

PART I
RESEARCH INTERESTS

PART I - RESEARCH INTERESTS

RDECOM-STC, PEO-STRI and ARI have the mission to develop and advance the state-of-the-art in simulation, training and instrumentation technology with the overall goal of producing more efficient and effective Army training, test and evaluation systems. Programs funded under this BAA will include exploratory and advanced research related to this mission as well as technology demonstrations. Collaboration between universities and industrial companies is encouraged. Projects should take maximum advantage of existing university and industry research and engineering programs and facilities, and those of the Army's sister services. It is envisioned that project emphasis will be in those areas that: explore and develop novel applications of new simulation, training and instrumentation technologies; explore new methods of implementing instructional principles in training devices; and foster productive and synergistic working relationships through interdisciplinary groups in which instructional specialists, engineers, psychologists and other specialists can work together to optimally develop technologies for equipment to train and assess the Army of the 21st century.

1. BATTLEFIELD SIMULATION RESEARCH

During the next decade there will be increasing demands for simulated representations of the combined arms battlefield for use in training, analysis, force development, combat development, materiel development, and operational tests and evaluations. These simulated battlefield environments must exhibit real-time interactions as perceived by humans synchronized in time and space such that war fighters, both individually and collectively, experience the complexity of dynamic force-on-force battlefield behaviors. Moreover, the simulated environments must be accredited based on validated models and methodologies. Research interests in this area include the following:

1-A. Engagement Simulation and Instrumentation Technology

The Army has successfully fielded the Multiple Integrated Laser Engagement System (MILES) as a means of providing non-lethal, real-time casualty assessment for direct fire, force-on-force engagement exercises. Current development efforts will extend capabilities to include indirect fire, area weapons, and extended data collection for use in after action reviews. With the introduction of increasing numbers of smart and "fire and forget" munitions, multi-spectral sensor systems, directed energy weapons (DEW) and the need to operate in obscured battlefield conditions, present approaches to pairing systems for real-time casualty assessment may no longer be adequate to support future engagement simulation requirements. Next generation engagement simulation technologies should be explored to increase the cost effectiveness of Combat Training Centers of the future. Research issues include:

- New or different approaches for determining real-time casualty assessment (RTCA) of weapons engagement simulations while providing high level resolution of aspect angle and location of hit for direct fire and smart munitions. Of particular interest are approaches which capitalize on the use of new, emerging capabilities of next generation fire control systems and reconnaissance, surveillance and target acquisition (RSTA) capabilities which both facilitate embedding RTCA and/or provide a system architecture

for a new generation of RTCA capabilities.

- The battlefield environment involves many complex elements, to include: new and different battlefield obscurants (IR and MMW), electronic systems, countermeasures, jammers, etc., Home station, Combat Training Centers and test activities require the capability to simulate and instrument a realistic battlefield environment for testing and training.

- Non-Line-Of-Sight (NLOS) weapons, such as the MK 19, over the horizon munitions fired from air and ground units are presently included with a labor-intensive effort. Many of these weapons are rapid fire and need to be compatible with high performance aircraft, both as a shooter and as a target. The home station and the Combat Training Centers (CTC) need to be able to simulate and "instrument" these NLOS weapons without using additional RF spectrum.

RDECOM-STC Technical Point of Contact is Mr. Frank Tucker, (407) 384-5448, Frank.Tucker2@us.army.mil.

1-B. Distributed Simulation Environments & Interoperability

Increased live training costs, reduced availability of training areas, and increased reliance on reserve component forces require developing capabilities for training the objective force by minimizing the need to go to the field. As the US Army continues to pursue transformation activities, warfighter platforms are becoming more and more interdependent and complex, embracing a system-of-systems approach. Similarly, training applications and capabilities will need to adjust to this paradigm; likely necessitating the collapse into a single training environment from the traditional Live-Virtual-Constructive domains. Accordingly, research efforts are needed to assist in developing hierarchical based standards; software services and product lines which better posture the training capabilities along a system-of-systems paradigm. These approaches and technologies should be shaped to embrace embedded training and embedded simulation future instantiations of the Interim and Objective Force. In addition, tools and applications need to be developed that accommodate multiple uses to include training, and mission planning and rehearsal.

A definition of Interoperability includes the functional equivalence provided by interchangeable components within a system or process in order to allow its components to be able to work together with no prior agreement over an agreed upon data communications path. RDECOM-STC is interested in simulation interoperability and component reuse across DoD, Army, other government, and non-government applications including the Entertainment Industry. We are interested in a framework that addresses the hard to solve interoperability problems, to include but not limited to, syntax, semantics, quality of service and synchronization. This infrastructure is needed for linking simulations of various types at multiple locations to create realistic, complex, virtual "worlds" for the simulation of highly interactive activities. This infrastructure brings together systems built for separate purposes, technologies from different eras, with focus on future technologies, products from various vendors, and platforms from various services and permits them to interoperate in a homogeneous synthetic environment. Part

of this interoperability research would include multi-resolution models, composibility, component definitions, interchange and standardization.

Some of the research issues and topics include:

- Low cost and extendable methods of linking/interoperating otherwise unclassified training systems with classified networks, such as Army Battle Command System (ABCS) systems.
- Finding ways to define and ensure "Fair Fight" between legacy training systems.
- Research methods for training systems to extend current databases across dissimilar operating systems and image generators.
- Developing an interoperable framework that is web based, allows for dynamic real time operations, is modular in design, is user friendly, utilizes component based and drag and drop technologies over the web.

- Definition, analysis and demonstration of system level standards for distributed simulator networks which preserve space and time synchronization of the simulated battlefield as perceived by war fighters. Component based, state variable descriptions of dynamic battlefield behaviors should be used. Research should incorporate or influence modular design approaches for individual simulators. Intra- and inter- network communications should be consistent with Open Systems Interconnection (OSI) communication standards.

- Approaches and methods for accrediting the simulated battlefield representation built upon verified and validated models of battlefield phenomena. Work should reflect a balance of battlefield interactions, which provide correct human perceptions within selected levels of simulator complexity and costs. Approaches may include methods for modeling the effect of networking specific sets of simulations/simulators to provide insight into interface problems, network problems, etc., prior to running an exercise. Techniques for establishing consistency along networked systems for data, algorithms, code and visual models are also of interest.

- Analysis, evaluation and proof of principle demonstrations of design architectures for large scale, distributed simulator networks.

- Approaches and methods to minimize and adjust for communications overloads on distributed simulator networks. As the number of active entities on networks increase, an overload of network channel capacity can be expected. Consideration should be given to load management which allows "graceful" degradation of system performance during periods of peak activity and allows scaling of the number of elements active on the network and the number of geographically separated sites.

- Techniques for real time network data filtering and compression/decompression in support of network simulation requirements for command and control, communications and wide band visual systems data. Work should focus on enabling distributed simulation networks to support tens of thousands of synthetic environment entities installed on hundreds of host computers/simulators at tens of geographically distributed simulation sites. Research factors of particular interest include degree of network data compression versus synthetic environment

fidelity and cost/capability analysis compared to current conventional approaches.

- Techniques for interconnecting simulators which have been separately developed with differing levels of fidelity onto a common network. Research should consider methods for interfacing, linking and integrating large scale simulation networks with war game simulations resulting in consistent and compatible simulation of the battle environment. Methods/processes for doing analyses using human-in-the-loop simulations should be examined.

- Techniques for collecting, sorting, and organizing performance data suited for providing real-time simulation and training feedback and/or after action reviews to training participants.

- Methods for identifying, screening, qualifying and quantifying soldier-machine and soldier-battlefield interface MANPRINT domain variables, issues and high drivers.

- Techniques for verifying and validating the distributed simulation environment. A distributed simulation is an abstraction of reality. As such, it is important to verify and validate that the simulated environment portrayed in each simulator represents the level of fidelity necessary for training transfer. This includes the level of fidelity of the physical mockup, the environmental stresses placed on the occupants as well as the visual presentations.

- Multi-level security over a distributed network. As we move into the future, there will be a need to conduct training events using classified information. We need techniques for establishing an accredited multi-level security distributed simulation environment network.

- Linkages between simulators, simulations, instrumented ranges and operational equipment. A complete distributed simulation environment will allow for the seamless interaction among different parts of a synthetic environment. Techniques are needed to address these interactions, especially those that involve the simulation of operational equipment by synthetic constructs.

- Techniques for interconnecting test and evaluation (T&E) ranges which have been separately developed to accomplish unique tasks.

- Improved instrumentation to link live player entities into distributed synthetic environments. Research should address the feasibility of homogenous, common terrain databases that can be used by major constructive simulations and virtual simulators.

- Methods to portray all of the Command, Control, Communications, Computers and Intelligence (C4I) parameters in distributed simulation environments.

RDECOM-STC Technical Point of Contact is Mr. Mark McAuliffe, (407) 384-3929, Mark.McAuliffe@us.army.mil.

1-C. Logistics and Combat Service Support M&S Technologies

Currently, Logistics is not readily integrated into maneuver training simulations to enable Force Projection and Sustainment preparation of FCS Brigade within the deployment timelines. To meet the Objective Force 96-hour deployment and follow-on sustainment requirement, Logistics M&S must be researched and developed to train and assess Force Projection and Sustainment impacts on mission readiness. This research will examine innovative logistics simulation tools, efficient models, and high-performance computing software and hardware architectures. These tools and models will enable logistics training and assessment capabilities for the Sustainment and Employment of the Objective Force to satisfy the deployment timeline and follow-on sustainment requirement. Currently, the Army's Synthetic Environment does not provide sufficient logistics fidelity to realistically constrain Battlefield Operating Systems (BOS), under simulated combat, in order to enable accurate Training, Force Development and Acquisition Decisions. Increasing logistics simulation fidelity and concurrently increased time/space resolution introduces greater computational complexity requiring approaches employing highly parallelizable algorithms amenable to efficient implementation on high performance cluster computing platforms. This research should be focused on technology necessary for Objective Force training and mission rehearsal by introducing realistic Logistics (Force Projection and Sustainment) effects. It should create the capability to achieve operationally driven shooter-to-production connectivity for multi-level training, mission rehearsal and assessment. It also should provide the granularity required to efficiently train and assess logistics fidelity at different levels of command. Research issues include:

- New and different approaches for determining and developing logistics training and simulation decision support tools and models for the total logistics picture.
- New and innovative ways to simulate and train Logisticians in battlespace situational awareness and predictive logistics for all classes of supply and other logistical assets.
- New and different approaches for training and simulation of logistics deployment planning and execution that promote timely, responsive, and effective force closure.
- Highly robust approaches for integrated logistics planning, scheduling and execution in dynamic and uncertain environments, applying principles of Complex Adaptive Systems Theory, employing autonomous agents and multi-agent systems, evolutionary computing, or self-evolving software architectures.
- Novel parallel and distributed algorithms and architectures with adaptive computational granularity enabling efficient implementation on high performance cluster computing platforms for simulation of realistic Logistics Force Projection and Sustainment effects.

RDECOM-STC Technical Point of Contact is Mr. Troy Dere, (407) 384-3882, Troy.Dere@us.army.mil

1-D. Synthetic Environment Data Modeling, Interchange, Access, and Reuse Development Effort

The synthetic environment is a critical element of models and simulations. It includes those physical aspects of the real world which provide the context for application-specific simulations. Interoperability of heterogeneous simulation systems depends heavily on sharing synthetic environment data in a consistent and complete manner.

The Defense Modeling and Simulation Office (DMSO) is establishing a common technical

framework for DoD modeling and simulation to facilitate the interoperability of all types of models and simulations, as well as to facilitate the reuse of modeling and simulation (M&S) components. This technical framework includes data standards, a common conceptual mission space model, and a High Level Architecture (HLA). The HLA defines a set of rules governing how simulations will interact with one another through a common runtime infrastructure using a shared object model. Objects are the real world entities that are of interest in a simulation and are characterized by their identity, their state, and their behaviors. The HLA will specify a set of rules for the predistribution and dynamic update of objects. The synthetic environment encompasses a critical subset of the HLA object model, and must be predistributed proper to, and updated during, the simulation session.

Currently, there is no uniform and effective standard mechanism for interchanging synthetic environments that include integrated terrain, ocean, and atmosphere data among M&S applications. A mechanism is required which facilitates standard representation of, and access to, existing synthetic environment data, increases the utility of legacy databases, and can be easily expanded to capture future modeling investments. A key goal of this effort is to develop an interchange mechanism which addresses these problems, facilitates broad reuse of synthetic environments, supports interoperability of heterogeneous simulation systems, and has application across the modeling and simulation community.

SEDRIS (Synthetic Environment Data Representation and Interchange Specification) is a proposed format-independent data representation model for interchanging synthetic environment databases. This includes any combination of (but not limited to): terrain, ocean, atmosphere, 3D icons/models, features, topology, sound, textures, symbols, and special effects. The SEDRIS Application Program Interface (API) facilitates efficient and intuitive access to data stored according to the SEDRIS data representation model. The Level 0 API allows minimal, but complete accessibility to SEDRIS data whereas the Level 1 API provides the capability to perform more abstract operations on SEDRIS data. Areas of interest include:

Topic I: SEDRIS Read API Prototype Initiatives

Develop access mechanisms for extracting all objects from one or more existing synthetic environment databases. Under this effort, it is anticipated that organizations which traditionally generate, or can generate, "complete and integrated" virtual simulation databases would first extract 3D icons/models, and subsequently would proceed to extract all remaining objects contained in the synthetic environment databases, including: features, topology, terrain surfaces, atmospheric and oceanographic data, etc. These access mechanisms will be based on the SEDRIS data representation model and built according to the SEDRIS Level 0 Read API specification. Provide analytic and visual evaluation, assessment, and comparison of the extracted data with the original data. The government may provide tools and utilities to better facilitate the comparison and evaluation.

Topic II: SEDRIS Advanced Prototype Initiatives

Apply the experiences gained in all efforts applicable to Topic I, M&S data exchange experience with existing or proposed formats, or other Mapping, Charting, Geodesy, and Imagery (MCG&I) data exchange experience, to any (or all) of the following:

- Implement the SEDRIS Level 1 Read API for an existing synthetic environment database

in terms of a previously implemented SEDRIS Level 0 Read API. Analyze the Level 1 API for completeness and recommend extensions or changes based upon the experiences gained from this effort. Provide analytic and visual evaluation of the interchange process and compare the extracted data with the original data.

- Analyzed the SEDRIS data representation model and develop a draft data exchange standard format. Enhance the draft format by incorporating the results of Topic 1 activities.
- Specify the Write API associated with the recommended format.

- Implement the Write and Level 0 Read APIs based on the recommended format. Develop a proof of concept data prototype which demonstrates the utilization of this Write and Read API.

Topic III: Advanced Architectural Issues in Synthetic Environments

- Analyze and develop extensions to the SEDRIS data representation model, Read API, and Write API to support dynamic exchange of synthetic environments. This includes issues associated with dynamic terrain and objects, evolving meteorologic and oceanographic (METOC) data, and shared HLA synthetic environment services. Implement a prototype that demonstrates exchange of dynamic environment data.

- Other areas not defined herein that enhance the representation, exchange, and use of synthetic environment data. For example, conducting interchange experiments in support of interoperability.

RDECOM-STC Technical Point of Contact is Ms. Thao Pham, 407-384-5460, Thao_pham@peostri.army.mil.

1-E. Rapid Construction of Urban Terrain Databases

This new Science and Technology Objective (STO) will prototype and demonstrate common data, data models, simulation tools and processes required to achieve the stated Army vision of a Common Synthetic Battlespace for Urban Terrain. This program will address the technology issues necessary to support current training systems, and future networked, real time, warfighter-in-the-loop simulations for programs like the Army's Future Combat System (FCS).

The Army is unable to rapidly develop interactive, high resolution virtual urban environments to conduct training and mission planning/rehearsal. The objective is to develop a tool suite focusing on the implementation and evolvement of common components and processes to support the development of multiple format high resolution urban terrain databases for use across the M&S domains (Virtual, Constructive and Live). The focus of the research is on the enhancements of tools to support rapid and accurate 3D building generation, building interiors, rapid building extraction, underground structures, efficient urban feature development, and GOTS/COTS interfaces with multiple formats. The research will leverage data sources such as Rapid Terrain Visualization (RTV), LIDAR, and AutoCAD for environmental data generation, and investigate alternate authoritative data sources for intensification of high-resolution structures to support constructions of

high-density urban terrain environments. The technology developed will be used in training and simulation systems to provide a better, faster, cheaper urban terrain generation capability to support mission rehearsal, training, planning, and Course of Action analysis. Detailed focus areas of interest are:

1. Analyze, evaluate, define M&S Training capabilities in support of Military Operations on Urban Terrain (MOUT) and Operations-Other-Than-War (OOTW) operations by leveraging existing technologies and evolving new research areas in database generation.
2. Design a process for the development of a Common Framework for construction and reuse of Urban Terrain databases.
3. Prototype an infrastructure, design an experiment using tactically realistic scenarios and demonstrate common representations, processes, and tools to automate and standardize across systems.
4. Validate and assess urban environment development process; and develop a methodology to assess interoperability issues when networked with live systems.
5. Test methodology to assess interoperability of linked virtual, constructive, and live systems.

RDECOM-STC Technical Point of Contact is Mr. Todd Kohler, 407-384-5439, Todd.Kohler@us.army.mil.

1-F. Position, Location, and Tracking for Live Training in Urban Terrain

RDECOM-STC is interested in technologies that improve live training of dismounted soldier and weapon system tactical engagements, particularly in urban terrain, where GPS and laser-based systems are inadequate. The Army's transformation to the Objective Force is bringing in new challenges for training, such as engagements that require the soldier to fire at targets that cannot be seen (also referred to as non line-of-sight (NLOS)), such as through a wall, or over buildings. During training, the soldier needs to know whether the target was hit, and to what degree of accuracy, without firing live munitions. The technology applied to solve these challenges must have the following characteristics or capabilities:

- Determine the pointing direction (bearing and azimuth) of a rifle-sized weapon with sufficient accuracy to establish a reasonable degree of certainty that a vehicle-sized target was hit.
- The ability to locate and track a soldier inside of buildings.
- Have the potential to be light and small enough to embed into the weapons systems the size of a rifle.
- Operate from battery power.
- The need for infrastructure to support the technology must be minimal, or ideally, none at all.

Additionally, RDECOM-STC is looking for technologies that improve or supplement our research on Ultra Wide Band (UWB) radio-based position, location and tracking. Areas of research interest include:

- Waveform leading edge detection.
- Wireless networking protocols.
- Extending wireless transmission distance.

RDECOM-STC Technical Point of Contact is Frank Tucker, (407) 384-5448; Frank.Tucker2@us.army.mil

1-G. Modeling and Simulation for Asymmetrical Warfare

Provide and demonstrate technologies, techniques, and strategies that can be used to model the new types of warfare that our Armed Forces are being faced with in their current operations. These types of warfare should include operations involving: crowd environments, terrorism, weapons of mass destruction (WMD), hostage situations, peace-keeping missions, operations other than war (OOTW) and etc. Emphasis of these technologies should be on the capability, within the constructive and virtual environments, to conduct these types of asymmetrical operations. The target constructive application should be the OneSAF Objective System (OOS). Long-range requirements for Army training, to which the proposed research should be sensitive include:

- Computer Generated Forces Behaviors (CGF) to include:
  - Crowd Modeling
  - A Terrorists Mind
  - Hostage Situations
  - Weapons of Mass Destruction
  - Peace Keeping Operations
  - Civil Support Team Operations
  - Special Forces Operations
  - Covert Missions
- Applications that will simplify the integration of these CGF behaviors into the OOS
- Visualization and modeling of these behaviors in a virtual environment
- CGF Learning Agents
- Composable Behavior Technologies Centered on Individual Combatant Behaviors
- Immersive Technologies that assist in Improving the Warfighter's Decision Making Process

RDECOM-STC Technical Point of Contact is Mr. James Grosse, (407) 384-3872, james.grosse@us.army.mil

1-H. Objective Force Experimentation

RDECOM STC's Objective Force Experimentation enterprise applies M&S technology to support the development and evaluation of new Army concepts, including those of the Future Combat Systems (FCS) and the transformation to the Objective Force. RDECOM STC provides a wide range of consultation services, hardware and software development, modification, and integration services, as well as experiment execution support to facilitate a complete, integrated solution for a broad range of customers. This experimentation support includes that focused at various remote Army distributed simulation-based facilities as well as work conducted at the Simulation Technology Center (STC) in Orlando, Florida. Combined, these facilities provide the ability to develop and conduct cost-effective research & development experiments, proof-of-principle demonstrations, prototype developments, and operational evaluations in all phases of force development, and are used to support combat development experiments, research, system development, demonstrations, training, and exercises. RDECOM STC plans, supports, and executes these efforts in consonance with the Army's Simulation and Modeling for Acquisition, Requirements, and Training (SMART) Simulation Based Acquisition tenants. RDECOM STC's M&S experimentation area includes the examination, tracking, research, development, and integration of both existing & new M&S technologies & tools to better support M&S experimentation needs. This includes areas such as:

- Manned and reconfigurable simulators,
- Semi-Automated Forces/Computer Generated Forces (SAF/CGF),
- M&S monitoring & execution control,
- Data collection & analysis,
- Networking,
- Interoperability, including Live/Virtual/Constructive simulation interoperability,
- Software reuse,
- Model & behavior composability,
- Advanced Distributed Simulation,
- Computer Generated Imagery (CGI) visual systems & Synthetic Natural Environments (SNE),
- Command, Control, Computers, Communications, Intelligence, Surveillance, and Reconnaissance (C4ISR) simulation and linking live C4ISR systems to simulation.
- Application of M&S in support of Joint service efforts

RDECOM STC Technical Point of Contact is Mr. Christopher J. Metevier, (407) 384-3865, Chris.Metevier@us.army.mil.

1-I. Modeling of Behavior(s) for Intelligent Unmanned Ground Systems

By 2015, one third of the operational ground Combat vehicles of the armed forces will be unmanned. To achieve this, research is needed to improve and advance the capability of intelligent autonomous unmanned ground vehicles within / in conjunction with the OTB environment. The majority of current robotic research is focused on mobility with specific

platforms; little research exists that is focused on battlefield missions, specifically research that is simulation oriented. Current robotics technology does not address the simulation of AI. Simulating unmanned systems within CGF will provide an analysis capability for FCS development. Exploring and extending current AI techniques will provide for more autonomous operation of unmanned systems. Providing single operator control of multiple unmanned systems and extending the simulation of AI techniques to on board robotic behavior modules will be a major factor in maintaining agile and versatile forces.

This research area will:

- Model simulations of complex mission behaviors for unmanned systems suitable for application to military battlefield domain in a real-time distributed simulation.

- Develop SAF-Robotics collaborative environments and provide effective methods and procedures for composite team performance

- Provide the environment to develop and investigate future robotic capabilities using learning agents and AI technology

- Provide complex mission task and coordination to live robotic systems

- Develop an advanced robotics S&T Testbed to optimize the development and employment of aid in analysis of future capabilities

- Develop fundamental advances in representing techniques for robotic behaviors at a very high level to include, but not limited to: Composable Behavior Technologies, Context Based Reasoning, Random Neural Networks and Learning Agents.

- Investigate issues related to Team Performance Assessment including the effectiveness of manned/unmanned units and operator control interface issues.

RDECOM-STC Technical Point of Contact is Julio de la Cruz , (407) 384-3733, julio.delacruz@us.army.mil

1-J. Computer Generated Forces

Research leading to improving and advancing the capability of intelligent interactive computer generated force simulations. Research is needed to determine critical behaviors and essential characteristics required for each force level modeled. Methodologies and approaches for scaleable CGF representation with the ability to reconfigure based on varying battlefield behavior are needed. Interfaces to enable composable behavioral modeling are sought.

This research area will:

- Develop adaptable CGF systems that approximate individual and unit capabilities and decision-making processes. This includes the ability to make mistakes and learn from them, identifying patterns of behavior in the opposing commander's use of

tactics, and recognizing opportunities to exploit an opponent's weakness.

- Investigate Operations Other Than War by modeling non-military representations in a CGF arena, both at an aggregated level and then at an entity level.

- Standardize SAF Databases by providing common databases and environmental routines that can be integrated in the various CGF systems currently supported by RDECOM-STC.

- Improve SAF Workstations by re-engineering the current HCI supported by the various SAF Systems RDECOM-STC supports to enhance the operators ability to control the units in exercises and create exercises faster and more realistically.

- Improve behaviors that interact with manned modules (E.g. Manned Modules act as commanders, rest of the units is SAF)

RDECOM-STC Technical Point of Contact is Julio de la Cruz , (407) 384-3733, julio.delacruz@us.army.mil

1-K. Medical Modeling and Simulation

Provide and demonstrate technologies, techniques and strategies for immersing the military medical community in a realistic, simulated military medical training environment for initial, , transition, refresher, and sustainment training. Individual and team training are of interest. Areas for consideration include:

- Imaging systems, such as holographic technologies and laser-optical projection systems.
- Total immersion from the point of injury to “return to duty status”.
- High-fidelity haptics.
- Linking to existing warfighter simulations.
- More realistic patient simulation technologies.
- Portable, rugged training systems.
- PC-based technologies.
- Medically related olfactory.
- Constructive and virtual medical simulation efforts.
- Cost effectiveness and increased test scores and skill levels.
- Long range requirements to reduce/eliminate the use of live tissue and cadavers in military medical training.
- Objective performance measures of knowledge and psycho-motor skills.

RDECOM-STC Technical Point of Contact is Jack Norfleet (407) 384-3897, Jack.Norfleet@us.army.mil

1-L. Web-based Collaborative Training Environments

Distributed learning has matured beyond simply converting plans of instruction to Web pages. However, there is considerable work to be accomplished before the vision of "anytime/anywhere tailored training" can be realized. The learning environment required of the Army's Objective Force is one in which individuals can learn or hone their skills, teams can collaborate and subject matter experts can provide their knowledge at anytime. Learners should be able to tap into an ever-growing body of knowledge, tailored to their needs, at anytime and anywhere.

To support the delivery of this learning environment, this research area will:

- Explore various facets of intelligent tutoring systems (ITSes), including, but not limited to:
    - Team-oriented ITSes which provide mentor-less coaching of various types of teams;
    - "Learning" ITSes which can apply lessons learned from students to expert and instructor models;
    - Interoperability of ITSes, allowing for a family of training and mission rehearsal simulations to use the same base model
- Apply state-of-the-art Advanced Distributed Learning (ADL) technology to different training arenas, including embedded training, medical simulations and massively multi-player games (note that this research area does not concentrate on these training arenas, but seeks to apply ADL technology to existing or emerging efforts being explored under other STC research areas.)
- Develop proof-of-concept training environments for various Army training arenas, integrating such disparate technologies as ITSes, learning managements systems, after-action review tools, and collaborative tools such as text chat, voice-over-IP, and electronic whiteboards.
- Develop guidelines for effective & efficient distributed training practices to provide guidance for Army & Joint commands tasked with providing distributed learning content, tools, practices and procedures.

The RDECOM-STC Point of Contact is Bill Pike, (407) 384-5349, Bill.Pike@us.army.mil.

1-M. Embedded Simulation & Training

RDECOM-STC is interested in investigating and advancing those technologies that improve the capability to embed simulation and training systems into combat systems, vehicles and individual soldier systems.

Topic I: Embedded Simulation & Training for Combat Systems and Vehicles

Embedded Simulation (ES) is a capability designed into a ground combat system (GCS) that enables the system to provide a necessary environmental feedback to train individuals, crew, and units and enhance operational capabilities, using their operation equipment. Training with operational equipment allows units to train anywhere and time, including while deployed. ES development may also aid in vehicle development and operational testing. The advent of emerging

technologies such as enhanced visual systems, miniaturization, and computational processing power combine to support on-vehicle/on-location training that is realistic, cost effective and environmentally friendly. Embedded simulation is a requirement for the Future Combat System (FCS). Pacing technologies include, but not limited to: Leader development training, embedded visual systems, Mounted/Dismounted Embedded simulation, Embedded training in complex urban areas, mission rehearsal, intelligent tutoring, embedded architectures (AAR,CGF, system management, etc.), and Embedded test environments.

RDECOM-STC Technical Point of Contact is Mr. Henry Marshall, (407)384-3820, Henry.A.Marshall@us.army.mil

Topic II: Embedded Training & Simulations for Dismounted Soldiers

The army needs portable (mobile) Embedded Training (ET) and simulation technological solutions to support the future dismounted soldier. ET and simulation technological solutions referenced under this topic is a capability designed into an individual soldier system. The resulting capabilities should empower the dismounted soldier and his unit with individual and/or collective training and simulation on-demand, anywhere, and anytime. The focus of this research is to develop and demonstrate embedded training & simulation capabilities that prepare the individual warfighter to take maximum advantage of evolving objective force systems and environments. Warfighter payoffs include capability to provide on-demand, multi-function training to support multi-skill soldier, and opportunity for dismounted soldiers to plan and rehearse mission while on the barracks, en-route to mission, or on the field. This research should also enable seamless interoperability with ET and simulation capabilities of the Future Combat System through common components and databases. Pacing technologies include, but are not limited to, augmented reality, multi-nodal interfaces, intelligent tutoring, interactive simulation courseware, intelligent computer generated forces, and advanced synthetic natural environments.

RDECOM-STC Technical Point of Contact is Mr. Pat Garrity, (407)384-3663, Pat.Garrity@us.army.mil.

1-N. Virtual Individual and Collective Training for Dismounted Objective Force Leaders and Soldiers

The Army is digitizing its dismounted units. Dismounted soldiers in the near future will be equipped with wearable computers, GPS, and digital displays integrated with sophisticated hand-held weapons systems. The systems of individual solders within a unit will be networked with each other and with remote sensor systems using secure radio links. Soldiers and leaders will need to be trained in both the operation of this equipment and in the tactics, techniques and procedures for using it in combat and non-combat operations. They will need to achieve and maintain a high level of proficiency, which indicates a need for training while deployed or deploying.

There is a need for research to develop and evaluate procedures and techniques for using low-cost simulation and augmented reality to enhance the fighting capabilities of digitally equipped dismounted individual soldiers and leaders. This will include training for individual

soldiers in the operation and use of technologically sophisticated individual weapons and equipment, and leader training in the tactics and techniques for their employment in combat.

ARI Technical Point of Contact is Dr. Bruce Knerr, (407) 384-3987, bruce_knerr@peostri.army.mil.

1-O. Wireless Communications and Networking

Wireless communications and networking technology research is of interest to RDECOM-STC, particularly capabilities to support training and testing instrumentation requirements. Current training and test range data systems are bound to a specific location due to their dependence on fixed government owned communications systems composed of transceivers, towers, and relay networks. Advances in wireless communications systems and networking can provide instrumented training and testing solutions at multiple training sites convenient to a unit's home station instead of only having such systems at a limited number of national level combat and maneuver training centers. It is envisioned that research in this area would include determination of the nature, bandwidth, and timeliness of training and testing data communications systems; the capabilities of wireless systems and networks to meet these requirements; and the operational and cost effectiveness of any proposed systems.

Specific areas of research interest to RDECOM-STC are as follows:

1) Distributed computing in a wireless Mobile Ad Hoc Network (MANET) environment
2) Intelligent peer to peer routing for hybrid MANET/wired networks
3) Seamless transitions from wired to wireless networks
4) Real-time connectivity forecasting
5) Scalable data streams in wireless networks
6) Intelligent wireless network quality-of-service monitoring, control and management
7) Novel communications devices or waveforms that make significant improvements to wireless networking performance

RDECOM-STC Technical Point of Contact is Frank Tucker, (407) 384-5448; Frank.Tucker2@us.army.mil

2. TRAINING DEVICE AND SIMULATOR RESEARCH

The following delineates two basic areas of interest for research potential, Visual Simulation and Virtual Reality:

2-A. Visual Simulation

Techniques for advancing visual presentation and representation of information and simulated combat environments which enable more efficient, effective, and innovative training capabilities. These training capabilities may have application in one or more instructional contexts to include classroom instruction, stand alone devices, simulators, and simulations and embedded training

capabilities designed into operational systems. These capabilities should be considered in the context of interoperability needs addressed in 2-A. Research issues and interests related to this area include:

- Methodologies and techniques and processes for more efficient organization and development of digital terrain and object data bases which provide multi-spectral/textured representations from a common data base, dynamic terrain features, free moving objects, and rapid production of geo-specific regions. Research should seek more cost effective means of rapid terrain data base generation, including correlated databases for supporting simulation functions such as semi-automated forces, plan view displays, radio communications, and paper and electronic maps. Efforts should explore how to represent terrain data and ensure consistency of terrain data across networked simulations that use different levels of terrain resolution. Methodologies to facilitate the transfer and reuse of existing terrain database for alternative rendering systems. Methodologies to automate the verification and validation of correlated databases for visual, sensor, radar, semi-automated forces, plan view displays, radio communications, and paper and electronic maps for tactical training systems.

- Computational schemes and architectures (hardware and software) which lead to processing higher volumes of real-time graphical or visual information presentation with physically smaller and/or lower cost image generators. Application of cost effective commercial PC graphics to multi-channel, deterministic real time rendering for military simulation applications.

- Display techniques which can accommodate requirements for a variety of fields of view and screen size, visual feature resolution (fidelity and enhanced areas of interest), adjustable color and gray scale range, and are suited for coupling with existing and emerging image generation capabilities. Application of digital light technologies as a replacement of the current generation of projection CRT based simulation display systems. Application of flat panel display technologies as a replacement of the current generation of direct view CRT based simulation display systems.

- Simulation techniques for providing more realistic, high quality, low cost sensor simulations and propagation models. Sensor simulations should include, but not be limited to, Forward Looking InfraRed (FLIR) (and specific FLIR system characteristics), day TV (near IR TV), image intensifier devices (Night Vision Goggles) and Synthetic Aperture Radar (SAR). Application of military sensor simulation technology to cost effective, commercial PC graphics platforms.

- Techniques to simulate weather in synthetic environments. Advanced simulation models are needed to support dynamic, real-time (30 Hz) weather simulation. Efforts should address interoperability of simulation models with heterogeneous visual and sensor training devices. Dynamic spatial and temporal parameters for atmospheric pressure, temperature, water content, and wind speed for broadcasting in a ADS environment should be addressed. Desired weather effects include rain, dust, ground fog, lighting effects, haze, time-of-day, time-of-year for natural illumination by the sun and moon. Weather models should be portable to Weather and/or Environment Terrain Server architectures. The

capability to prescript weather fronts to various locations with designated time, duration and intensity is desirable. Methods/procedures need to be developed that will provide automated weather forecasts to simulations based on scripted weather data.

PEO-STRI Technical Point of Contacts are John Collins 407-384-3840 john_collins@peostri.army.mil or Bruce Truog 407-384-3706 bruce_truog@peostri.army.mil

2-B. Virtual Reality (VR)

Advancement and techniques are desirable which seek to improve the training provided to soldiers by immersion into a rich virtual environment. Understanding training improvements which can be gained through providing a more realistic setting involving all five physical senses and techniques which promote this is a research topic of interest.

PEO-STRI is interested in advancing the state-of-the-art in VR systems and integral components thereof, which will advance Army training capability scenarios. Associated research of interest includes light weight helmets; helmet display techniques; display components such as miniature CRT's; partial reflection face plates; direct low power laser scanning of retina to eliminate optics; liquid crystal displays etc; tracking systems including head, eye, hand, finger, 1 and 2 hands, with the various coupling systems. Also of interest are audio presentation schemes, voice activated cockpit operation techniques for transmission of text and graphics to the helmet mounted display (HMD) including lightweight fiber optics, and electromagnetic transmission to and from the HMD, as well as techniques to minimize or eliminate the interference of head or helmet mounted displays with crew training tasks in combat vehicle and aircraft simulators.

Communicating the Virtual Scene to multiple communications centers while complying with High Level Architecture (HLA) networking, so as to permit multiple participants to be involved in the construction of a Virtual Scene is of interest.

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3. INSTRUMENTATION, TARGETS AND THREAT SIMULATORS RESEARCH

3-A. Instrumentation

Instrumentation is used in the training of personnel and in technical and operational testing of materiel. Instrumentation consists of electromagnetic, optical, audio, and mechanical systems that detect, measure, record, transmit, receive and process test and training data. Data is used to analyze physical parameters of the system under test (SUT) or to analyze the outcome of an event or set of events. Research opportunities include:

- A protocol for wireless data transmission/reception capable of accommodating a large number of players (4000-10,000) with bandwidth efficiency, high throughput capacity, low bit error rate, and long range capability. Built-in secure modes are also desirable.

- A technique to accurately determine geometric pairing for non-line of site weapon systems and weapon orientation (turret position, gun elevation and azimuth etc.) and indoor tracking of both personnel and weapon orientation.

- A technique for representing live entities in virtual-live simulation.

- Detection of buried munitions.

- Radar signature measurements in the millimeter wave bands.

- Dynamic measurements of munition radar cross sections.

- Interface between test and evaluation instrumentation and HLA.

- Test range interneting (both live and virtual).

- Live-to-virtual and live-to-constructive simulation interfaces.

- Virtual proving ground concepts.

- Field Instrumentation HLA Standards.

- Miniaturization of test and training player equipment.

- Opportunities to leverage new technologies for test and training to reduce acquisition and life cycle costs.

PEO-STRI Technical Point of Contact is Keith Gardner, (407) 384-5257, keith_gardner@peostri.army.mil

3-B. Targets

A number of different target systems are currently used by the gunnery training community and in test and evaluation. Materials such as plywood, plastics and fiberglass are used and tend to be bulky and become expensive due to high rates of destruction. Disposal of used targets can also present an environmental problem. Innovations in technology are desired for live fire target systems in the areas of materials, controls, user interaction and realism. The systems need to represent various threat and friendly vehicles and personnel in one or more of the signature spectrums (i.e., millimeter wave radar, infrared, acoustic, visual, and magnetic) for detection, acquisition, recognition, and engagement training or testing. The systems need to have the capability to accurately discriminate and record the location and azimuth of hits, near-misses, and misses for both supersonic and subsonic projectiles. Research opportunities include:

- Development of three-dimensional holographic targets with scoring to test the Army's 21st Century Land Warrior and associated weaponry. This technology may also be applied to the training ranges.

- Multi-signature targets to characterize performance of advanced sensors.
- Innovative virtual target prototyping and HLA compliant target signature libraries.
- Innovative target display techniques involving lasers, holography, and virtual reality.
- Interactive shoot-back targets on MILES and live fire ranges.

PEO-STRI Technical Point of Contact is Keith Gardner, (407) 384-5257, keith_gardner@peostri.army.mil

3-C. Threat Simulators

Threat simulators represent threat systems and may provide the actual appearance of the threat. They are generally higher fidelity than targets and are used for testing and training. They are manufactured in small numbers and are relatively expensive, unlike targets. Threat simulators are usually not destroyed during test. Research opportunities include:

- Modeling the atmosphere (to include electronic counter measures and jammers).
- Millimeter wave and infrared jammers.
- Wireless networks for the field.
- Voice input/output method for noisy environments.
- Neural networks for Semi-Automated Forces (SAF) and operator replacement.
- High bandwidth (greater than 2 MB/sec.).
- Data transmission via mobile systems using omni directional antennas.
- Increased data transmission range beyond 6 miles.
- Information operations.
- Virtual video injection.
- Air defense radars including phased array antenna simulators.
- Reconfigurable threat simulators.
- Virtual-to-live threat simulation interfaces.

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keith_gardner@peostri.army.mil

4. TEST AND EVALUATION RESEARCH

Key emerging technologies have caused a shift from evolutionary to revolutionary changes in weapon systems. Testing has not kept up technologically. Examples are the struggle to meet the requirements of smart munitions testing and the simulation of electromagnetic environmental effects. Current testing capabilities are often developed on the fly, just in time for the test and often using off the shelf technology. This approach is far from optimum and will not provide the needed capability for the future. Opportunities should be explored to leverage emerging instrumentation technologies for multiple applications. Projected testing requirements include autonomous target recognition, electric gun and smart munitions capabilities, and projectile flight characteristics. In order to adequately characterize new weapon systems, improvements are needed in the following testing capabilities:

- Multiple object tracking.
- Measurement of projectile flight dynamics.
- T&E of directed energy weapons.
- T&E of low observable.
- T&E of advanced sensors.
- Application of image processing and enhancement to T&E.
- Neural networks.
- Frequency monitoring capabilities.
- Subminiature and micro systems testing.
- Low observable signatures.
- MOUT environment.
- Cognitive reasoning.
- Information Operations.
- Frequency saturation.

PEO-STRI technical Point of Contact is Mr. James Todd, (407) 384-3905, James_Todd@peostri.army.mil.

5. WARGAMING RESEARCH

5-A. Wargaming Simulations

Currently wargame simulations manipulate stochastic and deterministic relationships depicting the conduct of combat to determine the outcome of battlefield events. Using this approach, the number of events that can be processed in a given time slice is limited. As the scope of a battle simulation is increased, the resolution of the battle calculations must be reduced in order to maintain operation in real-time. When the resolution is decreased, typically the realism or accuracy of the outcome is also decreased. To conserve scarce resources, there is a continuing need to reduce support personnel and to eliminate the need for them and the training audience to travel to a central location to conduct a training exercise. As the Army command and control systems evolve, there is a need for battle simulations to interface directly with these command and control systems to achieve realism in training and to "train as we fight." To overcome these shortcomings, the Army is attempting to distribute parts of the battle simulation to the home stations of the support personnel and the personnel being trained. Research in this area will investigate means of increasing the scope of the battle simulations while maintaining a high level of accuracy by investigating new algorithms and computation techniques, applying distributed/parallel processing technology, exploiting evolving computer technology, applying techniques of artificial intelligence, and otherwise increasing the efficiency and realism of battle simulations while maintaining real-time operation. Additionally, research could investigate means of reducing support requirements and distributing the conduct of training to the home stations of the participants. Implied is the need for enhanced communications techniques/protocols and data compression in order to handle the high volume of data required in a training exercise. Innovative concepts in developing multi resolution objects in simulation are of interest in support of object-based systems such as Warfighter's Simulation (WARSIM) and Joint Simulation (JSIMS). The requirement to interface with command and control systems will drive research in advanced hardware and software modularity techniques and embedded training in operational systems. Research into training effectiveness or the development of approaches for measuring effectiveness is also encouraged. The use of existing software/models in innovative cost-effective solutions should also be considered as a research objective. Important related research includes:

- Human Factors in Combat Models. Combat models need to account for the impact of humans in combat and the impact of combat on humans. Level of training, duration in close combat, time in theater, casualty levels, availability of religious support, quality of senior leadership are just some of the factors that should be taken into account when assessing the combat capability of units in simulation models. To properly train unit commanders and staffs to include these types of factors in their wartime decision making, they must be included in their peacetime training environment.

- Modeling of mistakes. One of the impacts of human factors in combat is the amount and type of mistakes made by individuals. Training simulators need models for inserting subordinate unit mistakes into the training environment.

- Interoperability issues in both Constructive and Virtual simulations. Research into data requirements for representations at the two levels of simulation and addressing the

question of interoperability for a common terrain.

- New missions. Simulation models are needed to train units in a variety of operations other than war missions, to include: disaster relief, deployment, redeployment, peacekeeping, noncombatant evacuation operations, United Nations (U.N.) security force duty and civil emergencies.

- After Action Review (AAR). The need to integrate diverse sources of data into a meaningful feedback package remains one of the fundamental challenges of battlefield simulation.

- To integrate audio, video, control, position location, and player status data with various charts and slides of doctrine and maps in a short time demands new methods and equipment.

PEO-STRI Technical Point of Contact is Mike Wright, (407) 384- 3873, mike_wright@peostri.army.mil

5-B. Voice Generation for Embedded Signal Intelligence Training

Develop and demonstrate capabilities required to generate large quantities of communication traffic to stimulate Signal Intelligence Systems in a distributed simulation environment. Capabilities shall strongly emphasize embedded training for the Voice Interceptor, MOS 98G. The design will be compatible with the WARFIGHTER'S SIMULATION (WARSIM) 2000, and the WARSIM Intelligence Module (WIM). The design will provide realistic, high-fidelity intensive scenarios that replicate combat or stability. The design shall also replicate support operations which will allow training on real world Command, Control, Communications, Computers, and Intelligence (C4I) equipment.

PEO-STRI Technical Point of Contact is Mike Wright, (407) 384- 3873, mike_wright@peostri.army.mil

6. TRAINING SYSTEMS RESEARCH

6-A. Instructional Technology

The use of new training and simulation technology must be based on instructional technology if it is to achieve its maximum potential for effective training. This instructional technology should consist of theoretically or empirically derived and empirically validated methods, procedures, rules, and guidelines that support the development and employment of effective instructional strategies. Both the macro (across devices) and micro (within a single device) levels should be addressed. Methods for improving the employment of existing and future devices, simulations and simulators are desired. Research issues of interest include:

- Strategies for improving the acquisition and retention of individual and team skills.

- Procedures for assigning tasks and allocating training resources to individual or team training to maximize training effectiveness.

- Effectiveness of instructional features (replay, freeze, restart, etc.).

- Procedures for assessing performance and providing feedback on crew and unit combat skills.

- Procedures for supporting the instructor/operator in the unit setting.

- Intelligent tutoring systems, in the context of an embedded component in training devices or as a stand alone system, which will provide capabilities for individualized instruction, coaching, and problem diagnosis in an intelligent and natural way.

- Evaluations of training strategies or systems.

ARI Technical Point of Contact is Dr. Bruce Knerr, (407) 384-3987, bruce_knerr@peostri.army.mil.

6-B. Training And Performance Measurement For Digital Networked Military Units

The Army is fielding digital communication systems to all echelons. These systems require soldiers to employ new skill sets to exploit their capabilities. Digital systems also produce new challenges for observer/controllers and training analysts conducting collective training. Research is needed to develop training methods that train soldiers to exploit digital system capabilities. New approaches are also needed to measure digital skills within the context of unit performance.

ARI Technical Point of Contact is Dr. Larry Meliza, (407) 384-3992, Larry_Meliza@peostri.army.mil

6-C. Objective Force Training Methods

Army transformation to the Objective Force will result in lighter vehicles fighting on a much more dispersed battlefield. The availability of a wide range of sensors, a variety of direct and indirect fire weapons systems and the utilization of robotic platforms will change the dynamics of the battlefield and produce training challenges. At the platform level the sensor-decider-shooter loop will be a key element in the success of the Objective Force. Training methods will be needed to prepare soldiers to utilize all the assets available to them to confront the very complex tactical situations they could face. Embedded training will be a key element in future combat systems. Embedded training will likely operate across the same communications network that will be used for operations. Research is needed to address development of training approaches and methods that take into account the technological advances of system of systems such as the Future Combat System and address the capabilities of embedded training for individual, crew and collective training.

ARI Technical Point of Contact is Dr. Paula Durlach, (407) 384-3982, Paula_Durlach@peostri.army.mil

7. COLLISION AVOIDANCE DEMONSTRATION

The DARPA OAV Sensor Integrated Real Time Information System (OSIRIS) Program is essential in order to transition the small Unmanned Air Vehicle System (UAVS) into the Future Combat Systems (FCS) program and other DOD programs in support of deployed U.S. forces. The OAV/MAV ACTD projects goal is to provide superior U.S. military systems in the areas of distributed autonomous air vehicles the ability to provide surveillance and reconnaissance to small units. These systems will improve U.S. effectiveness in deterring conventional and terrorists' warfare on both foreign and domestic territories. In pursuit of this mission, the OSIRIS program has to perform two main functions. The first function is the transition of this revolutionary weapon systems and associated subsystems to the appropriate military units. Secondly, the program will continue to identify and exploit new technologies, specifically state of the art integrated sensor technology, which will serve as the basis for revolutionary systems development, maintain the necessary margin of technological superiority, and provide the flexibility and option for responding to changing U.S. strategy.

Great latitude in prototype architecture and testing methods for development are encouraged. Field experiments for evaluation of strengths and weaknesses will focus development efforts and assist in understanding the tradeoffs in performance in conditions relevant to future missions for the vehicle.

The purpose is to fund research and development efforts to enhance DoD's capabilities for enabling collision avoidance in the 9-inch version of the GFE ducted fan vehicle and securing/transmitting information for battle damage assessment.

The research area will:

- Assess and develop a sensor suite system highlighting advanced technology for small autonomous air vehicles that will provide situation awareness, target location, collision avoidance and operations in complex terrain
- Develop advanced technology for MAVs and OAVs;
- Research and assess strengths and limitations of each Collision Avoidance/OSIRIS system based on actual field experiments under the following conditions: Under Canopy, MOUT, Inside Buildings, and Inside Caves and Tunnels;
- Develop and validate critical technology for understanding sensor suite system performance with coordinated use of small numbers of vehicles and degraded communications or sensors.
- Exploit current advanced sensor concepts in order to advance sensor suite real time information capabilities, specifically Mono-vision, Stereo-vision (Visible and IR), Acoustic,

LIDAR and RADAR. Sensors may be integrated from existing components and should be non-developmental (no chip development).

- Critical areas of software development include: Sensor processing and fusion; object detection and classification; the ability to experiment, diagnose and improve; and vehicle and sensor control. The following design considerations should also be considered: processing requirements, electrical and thermal accommodation, protection from and operation in environment (rain, snow, fog, manmade obscurants, hail & sleet impact, …) and data collection.
- Other relevant areas of research include: robotic behavior control systems, intelligent autonomy advanced robotic CA concepts, airborne systems, low probability of detection, interception, & jamming technology, and systems integration.

RDECOM-STC Technical Point of Contact is Michelle Kalphat, (407) 384-3862, Michelle_Kalphat@peostri.army.mil.

8. **ADDITIONAL RESEARCH INTERESTS**

Research conducted in technology fields that are broader than those identified in the preceding paragraphs may be of considerable interest. Such research relates to resolving technical issues that are impediments of optimal cost-effective Army programs involving simulation, training and/or instrumentation.

The RDECOM-STC technical POC for Simulation, Training and Instrumentation Research Mr. Mark J. Stoklosa, Principal Investigator, who may be reached at (407) 384-3928 or e-mail mark.j.stoklosa@us.army.mil.

PART II

PROPOSAL PREPARATION AND SUBMISSION

PART II - PROPOSAL PREPARATION AND SUBMISSION

1. GENERAL INFORMATION

Organizations or individuals interested in submitting research proposals to RDECOM-STC, PEO-STRI or ARI should **make preliminary inquires on the general need for the type of research** effort contemplated before expending extensive time and effort in preparing a detailed research proposal. A formal proposal should present the proposed research effort in sufficient detail to allow RDECOM-STC, PEO-STRI or ARI to evaluate the scientific merit and relevance of the proposed research.

RDECOM-STC, PEO-STRI and ARI encourage nonprofit organizations, educational institutions, historically black colleges and universities, minority institutions, small business, and small disadvantaged business concerns to submit research proposals for consideration.

Most of the information needed for proposal preparation can be found in Section 2 of this part. Blank proposal forms, included in Part V of this BAA, are designed to provide all required information needed for contracting purposes. Use of the proposal forms will expedite award of the research contract.

ELIGIBILITY

To be eligible for award of a contract, a prospective contractor (except other Governments, including state and local Governments) must meet certain minimum standards pertaining to financial resources, ability to comply with the performance schedule, prior record of performance, integrity, organization, experience, operational controls, technical skills, facilities, and equipment.

RDECOM-STC, PEO-STRI and ARI generally encourage research contracts either with or without Cooperative Agreements with foreign countries, where possible. Contracting will exclude countries that are on the State Department List of Countries that support terrorism as stated in Part V - Proposal Forms, Representations and Certifications, DFAR Clause 252.209-7001 entitled, "Disclosure of Ownership or Control By A Foreign Government That Supports Terrorism (MAR 1998)."

FOREIGN NATIONALS PERFORMING UNDER RESULTANT CONTRACT

The International Traffic in Arms Regulation (ITAR) and National Industrial Security Program Operating Manual (NISPOM) require an approved **Technology Control Plan** (TCP) when foreign nationals are assigned to a cleared contractor facility on an extended visit and for foreign nationals who are employed by the contractors. The minimum requirements for a TCP are:

1. Measures (e.g., unique badges, escorts, separate work area) to control access to the specific information for which Government disclosure authorization has been obtained.

2. A description of the elements of export controlled information to which the foreign national may have access and procedures for controlling this access.

3. A description of procedures for the indoctrination of the foreign person and company personnel who will be in contact with the foreign national on government security and technology transfer policies, disclosure guidance and the provisions of the TCP. The disclosure guidance must be emphasized to those other employees who will have frequent contact with the foreign national.

4. Procedures for controlling access to reproduction equipment, automated information systems, and telefax equipment.

5. A requirement that the foreign national sign a certificate, witnessed by the FSO, certifying that he or she acknowledges, understands and shall comply with U.S. Government requirements regarding access to, use, and retransfer of technical data, and will comply with applicable provisions of the TTCP.

6. Identification of a company employee who will be responsible for monitoring the activities of the foreign national at the facility.

The local Foreign Disclosure Officers (FDOs) must approve access by foreign nationals working on unclassified public domain contracts for the duration of the contract, provided the foreign nationals have appropriate work authorization documentation.

In those instances where foreign nationals are identified to perform under any resultant contract and employment eligibility documentation was not submitted for approval with the Offeror's proposal, the employment eligibility documentation specified at 8 CFR 274a.2 shall be submitted to the Contracting Officer for review and approval prior to the foreign national's performance.

Offerors not employing foreign nationals in performance of any resultant contract may disregard this provision.

For further information, please contact: US Army RDECOM
Simulation Technology Center
ATTN: Mr. Mark J. Stoklosa
12423 Research Parkway
Orlando, FL 32826-3276

POST-EMPLOYMENT CONFLICT OF INTEREST

There are certain post-employment restrictions on former federal officers and employees, including special Government employees (Section 207 of Title 18, United States Code). If a prospective offeror believes a conflict of interest may exist, the situation should be discussed with the Contracting Officer and legal personnel before time and effort is expended in preparing a proposal.

SUBCONTRACTING

Pursuant to Section 8(d) of the Small Business Act (15 U.S.C. 637(d)), it is the policy of the Government to enable small business concerns to be considered fairly as subcontractors to contractors performing work or rendering services as prime contractors or subcontractors under Government contracts. If the total cost proposal exceeds $500,000, any large business is required to include a Small, Small Disadvantaged, and Women Owned Subcontracting Plan with its proposal package in accordance with FAR 52.219-9.

TITLE TO EQUIPMENT

Title to equipment or other tangible property purchased with contract funds will be disposed of in accordance with Contracting Officer instructions at the time of contract completion.

PROPOSAL SUBMISSION

Proposals may be submitted at any time, however, new starts are normally obligated early within the fiscal year (See Appendix A). All proposals should include the information specified in this BAA Announcement in order to avoid delays in evaluation. Be sure to specify the Commercial and Government Entity (CAGE Code), the DUNS Number, and the Tax Identification Number (TIN) with your submission. Completion of the Representations and Certifications as well as registration in the DoD's Central Contractor Registration (CCR) Database will be a prerequisite before receiving an award.

A proposal for continuation of a given research project will be considered on the same basis as proposals for new awards. The proposal should be submitted sufficiently in advance of the completion of the existing contract so that if it is accepted, support may be continued without interruption.

Submittal of an original, with the signature of an authorized official and two (2) copies of the proposal will expedite the evaluation process. The mailing envelope as well as the cover of the proposal should be marked with the BAA Number N61339-01-R-0023 (TSD 25353, Mrs. Vanessa Dobson) along with the name of scientific point of contact responsible for the research topic.

2. PROPOSAL PREPARATION INSTRUCTIONS

1. General.

a. The proposal is the only vehicle available to the offeror for receiving consideration for award. The proposal must stand on its own merit; only information provided in the proposal can be used in the evaluation process leading to an award. The proposal should be prepared simply and economically, providing straightforward, concise delineation of capabilities necessary to perform the proposed work. The technical proposal must be accompanied by a fully supported cost proposal as cost and technical considerations are reviewed simultaneously.

b. Proposals containing data that is not to be disclosed to the public for any purpose or used by the Government except for evaluation purposes shall include the following statement on their cover page.

> The proposal includes data that shall not be disclosed outside the Government and shall not be duplicated, used, or disclosed - in whole or in part - for any purpose other than to evaluate this proposal. If, however, a contract is awarded to this offeror as a result of - or in connection with - the submission of this data, the Government shall have the right to duplicate, use, or disclose the data to the extent provided in the resulting contract. This restriction does not limit the Government's right to use information contained in these data if they are obtained from another source without restriction. The data subject to this restriction are contained in sheets _____.

The Offeror shall also mark each sheet of data it wished to restrict with the following legend:

> Use or disclosure of data contained on this sheet is subject to the restriction on the title page of this proposal.

c. To ensure all technical proposals receive proper consideration, the Government-recommended proposal format shown below should be followed as closely as possible. This format can most easily be incorporated as the proposal table of contents and serves as a final checklist as well.

2. **Proposal Contents/Checklist.**

PART I - Technical Proposal

Cover Page
ii Table of Contents
iii List of Illustrations/Tables
iv Executive Summary
1.0 Technical Approach
1.1 Technical Discussion
1.2 Technical Program Summary
1.3 Risk Analysis and Alternatives
1.4 References
2.0 Special Technical Factors
2.1 Capabilities and Relevant Experience
2.2 Previous or Current Relevant Independent Research and Development (IR&D) Work
2.3 Related Government Contracts
2.4 Facilities/Resources
3.0 Schedule
3.1 Time Line Chart by Task
4.0 Program Organization
4.1 Organization Chart(s) with Key personnel
4.2 Management and Technical Team
4.2.1 Prime Contractor Responsibilities
4.2.2 Subcontractor(s) Responsibilities
4.2.3 Consultant(s) Responsibilities
4.3 Resumes of Key Personnel
5.0 Appendix(es)

PART II - Contractor Statement of Work

1.0 Scope
1.1 Objective
1.2 Background
2.0 Applicable Documents
3.0 Tasks/Technical Requirements

NOTE: PLEASE USE THE ABOVE DECIMAL NUMBERING SYSTEM FOR PROPOSAL PREPARATION.

3. **Proposal Contents.**

PART I - Technical Proposal

a. **Cover Page**: The cover page should include the BAA Number, research topic and reference number, name and telephone number for the principal points of contact (both technical and contractual), and any other information that identifies the proposal. The cover page should also contain the proprietary data disclosure statement, if applicable.

b. **Table of Contents:** It is highly recommended that the Offeror follow the above table of contents and use it for a final quality-control checklist.

c. **List of Illustrations/Tables:** This list is a quick reference of charts, graphs, and other important information. A separate list of Tables is recommended.

d. **Executive Summary:** The executive summary allows the offeror to present briefly and concisely the important aspects of its proposal to key management personnel. The summary should present an organized progression of the work to be accomplished, without the technical details, such that the reader can grasp the core issues of the proposed program. The Executive Summary should rarely exceed two pages.

e. **Technical Approach:** In this section, the Offeror should provide as much technical detail and analysis as is necessary or useful to support the technical approach they are proposing. One must clearly identify the core of the intended approach. It is not effective to address a variety of possible solutions to the technology problems.

(1) **Technical Discussion:** No technical approach is without its limitations or shortcomings. Every issue should be identified and compared with the successes/failures of previous approaches. A tradeoff analysis is a good way to make this comparison and should be supported by theory, simulation, modeling, experimental data, or other sound engineering and scientific practices. If the offeror has a "new and creative" solution to the problem(s), that solution should be developed and analyzed in this section. The preferred technical approach should be described in as much detail as is necessary or useful to establish confidence in the approach.

(2) **Technical Program Summary:** This section summarizes the above technical discussion in an orderly progression through the program, emphasizing the strong points of the proposed technical approach.

(3) **Risk Analysis and Alternatives:** Every technology has its limitations and shortcomings. The proposal evaluator(s) will formulate a risk assessment and it is in the best interest of the Offeror to have its own understanding of the risk factors presented. Critical technologies should be identified along with their impact on the overall program as well as fallback positions that could still improve on existing approaches.

(4) **References**: Any good technology discussion must present the basis for and reference the findings cited in the literature.

f. **Special Technical Factors:** In this section, the Offeror should describe any capabilities it has that are uniquely supportive of the technology to be pursued. The following subparagraphs are offered as possible areas to be addressed.

(1) Capabilities and Relevant Experience
(2) Previous or Current Relevant IR&D Work
(3) Related Government Contracts
(4) Facilities/Resources

g. **Schedule**: The schedule represents the Offeror's commitment to perform the program tasks in an orderly, timely manner.

(1) **Time Line Chart by Task:** Each major task identified in the SOW must appear as a separate line on the program schedule. Planned meetings, such as kick-off, presentations (including final), Technical Interchange Meetings, etc., must be included in the Time Line. The Time Line must also indicate the anticipated meeting site.

h. **Program Organization:** In this paragraph, the Offeror should present its organization's ability to conduct difficult technical programs. Any pertinent or useful information may be included in this paragraph, but a minimum recommended response should address the following subparagraphs:

(1) **Organizational Chart(s) with Key Personnel**: Include prime contractor and subcontractor organization charts.

(2) **Management and Technical Team:** This should specifically identify what tasks w1ll be performed by which party and why each subcontractor, if any, was selected to perform its task(s).

(a) Prime Contractor Responsibilities
(b) Subcontractor(s) Responsibilities
(c) Consultant(s) Responsibilities

(3) **Resumes of Key Personnel:** Include the resumes of the prime contractor, subcontractor, and consultant personnel to include the manes, brief biography, and list of recent publications of the offeror's key personnel. Documentation of previous work or experience in the field of the proposer is especially important.

i. **Appendix(es):** Appendices may include technical reports, published papers, and referenced material. A listing of these reports/papers with short descriptions of the subject matter is usually adequate. Do not provide commercial product advertising brochures; these are unwanted.

PART II - Offeror Statement of Work (SOW)

a. It is the intent of the Government to use the Offeror's SOW, as written, provided that the Offeror's SOW accurately describes the work to be performed, is enforceable, and is void of inconsistencies. If, in the Government's opinion, the Offeror's SOW does not reflect these requirements, the Government will prepare a SOW using information available in the offeror's proposal; this process may delay the award. **The SOW shall be a separate and distinct part of the proposal, and must also be provided on a CDROM in the format called out previously**. The proposed SOW must contain a summary description of the technical methodology as well as the task description, but not in so much detail as to make the contract inflexible. **Do not include any proprietary information in the SOW**.

b. The following is offered as a recommended format for the SOW. Begin this section on a new page. Start your SOW at Paragraph 1.0. Remember a SOW only has three sections. (See MIL-HDBK-245D for additional guidance)

(1) **1.0 Scope -:** This section is intended to give a brief overview of the specialty area and should describe why it is being pursued, and what you are trying to accomplish.

(2) **1.1 - Objective**: This section provides an overall concise picture of the work to be accomplished. This should include the technology area to be investigated, goals to be achieved, and major milestones for the effort. The key elements of this section, however, are task development and deliverables. This section should describe in a clean-cut statement, the anticipated end result or end product of the effort. It must also be consistent with the detailed requirements stated in the 3.0 section.

(3) **1.2 - Background:** This section includes any information, explanations, or constraints that are necessary in order to understand the requirements. It may include relationship to previous, current and future operations. It may also include techniques previously tried and found ineffective.

(4) **2.0 - Applicable Documents:** The Offeror shall identify appropriate documents that are applicable to the effort to be performed. This section shall include a listing of all documents used as a reference in the technical requirements (Section 3.0) and specify the exact title, revision and date.

(5) **3.0 - Task/Technical Requirements:**

(a) The detailed description of tasks, which represent the work to be performed under the contract, are to be considered binding. Thus, it should be developed in an orderly progression and in enough detail to establish the feasibility of accomplishing the overall program goals. The work effort should be segregated into major tasks and identified in separately numbered paragraphs according to a numeric decimal system. Each numbered major task should delineate by subtask the work to be performed. The SOW MUST contain every task to be accomplished. The tasks must be definite, realistic, and clearly stated in performance terms. Use "shall" whenever the work statement expresses a provision that is binding. Use

"should" or "may" whenever it is necessary to express a declaration of purpose. Use "will" in cases where no contractor requirement is involved; i.e., power will be supplied by the Government.

(b) If presentations/meetings are identified in your schedule, include the following paragraph in your SOW:

"Conduct presentations/meetings at times and places specified in the Contract Schedule."

(c) The Offeror shall reference/acknowledge in the SOW all specified data items that were attached to the letter requesting a formal proposal.

PART III - GUIDELINES FOR COST PROPOSALS

a. For proposal pricing purposes, Offeror should assume a contract start date of ninety (90) days after submission of the proposal.

b. The Government contemplates award of a Cost-Plus-Fixed-Fee (Completion) type contract resulting from this proposal.

c. The Government does not anticipate that the conditions for adequate price competition at FAR 15.403-1(c)(1) will exist. Submission of cost or pricing data in accordance with FAR 15.406-2, maybe required as part of the proposal as set forth below if the proposed contract value is $500,000 or more. If the proposed contract value is under $500,000, then information other than cost or pricing data is requested as set forth below.

d. If the proposal is $500,000 or more, submit a completed Proposal Cover Sheet (Cost or Pricing Data Required), or a cover sheet of the Offeror's choice that contains the same information. If the proposal is under $500,000, submit a completed Proposal Cover Sheet (Cost or Pricing Data Not Required), or a cover sheet of the Offeror's choice containing the same information. These forms are attached hereto for your convenience.

e. Submit a completed DD Form 1861 or provide the information necessary to complete the DD Form if Facilities Capital Cost of Money is proposed.

f. Changes (additions, deletions, or modifications) to contract pricing proposals will include documentation indicating how previously submitted proposal(s) are impacted or affected. The Offeror shall ensure that the Government official directly negotiating the acquisition is furnished with the latest cost or pricing information available to the Offeror.

g. The standard Table of Contents should be used when preparing cost proposals. A copy of this Table and instructions for its completion follow:

(i) The Table of Contents should appear exactly as set forth on the attached sample. Do not omit any topics or elements. Additional topics may be added.

(ii) The Table of Contents should be one of the first three pages in the cost proposal. All pages must be numbered.

(iii) All blanks must be filled in, either with the applicable page numbers, or "NA."

(iv) Items 1, 2, 3, 4, 5, 6, 8, 9, and 16 are required for all proposals and must always show page numbers. The other items must have page numbers indicating where the applicable information is located whenever these costs are included in the total proposed contract amount.

(v) The required information must be included when it applies.

(vi) Subcontractors' proposals must be similarly structured. All subcontracted work must be properly identified as such. If a subcontractor elects to submit an abbreviated proposal to Offeror, it is Offeror's responsibility to see that the subcontractor simultaneously submits a complete detailed proposal properly identified directly to the Contracting Officer. Offeror must ensure that subcontractor adheres to the guidance set forth herein. FAR 15.404-3 requires that Offeror provide an analysis of subcontractors' cost proposals. To that end, Offeror's proposal must:

(1) Identify principal items/services to be subcontracted.

(2) Identify prospective subcontractors and the basis on which they were selected. If non-competitive, provide selected source justification.

(3) Identify the type of contractual arrangement contemplated for the subcontract and provide a rationale for same.

(4) Identify the basis for the subcontract costs as included in Offeror's proposal (e.g., firm quote or engineering estimate, etc.).

(5) Identify the cost or pricing data or information other than cost or pricing data submitted by the subcontractor.

(6) Provide a price analysis of the proposed subcontract in accordance with FAR 15.404-1(b). Provide an analysis concerning the reasonableness, realism and completeness of each subcontractor's proposal. If the analysis is based on a comparison with prior prices, identify the basis on which the prior prices were determined to be reasonable. If price analysis techniques are inadequate or FAR requires submittal of subcontractor cost or pricing data, provide a cost analysis in accordance with FAR 15.404-3(b). Cost analysis should include, but not be limited to, an analysis of materials, labor, travel, other direct costs and proposed profit rates.

(vii) The cost proposal should be limited to the minimum number of pages necessary to satisfy the specific requirements set forth herein. Submission of volumes of computer-generated data to support the cost proposal is not necessary or desired. If computer-generated data is essential to support the cost proposal, it may be submitted as an addendum and must be clearly

cross-referenced to the material it supports in the cost proposal.

(viii) Cost proposals should represent Offeror's best response to the solicitation. Any inconsistency, whether real or apparent, between promised performance and cost or price data must be fully explained in the proposal. Failure to explain any significant inconsistencies may demonstrate Offeror's lack of understanding of the nature and scope of the work required. Accordingly, cost proposals must be sufficient to establish the reasonableness, realism and completeness of the proposed cost/price. Further, any modifications made to the initial proposal must likewise be thoroughly supported in writing regardless of whether such changes are made during negotiations or at the time of a proposal revision.

COST PROPOSAL TABLE OF CONTENTS

ITEM PAGE NO(s)

ITEMS PAGE NO(s)

14. Subcontractor's proposal, with prime Offeror's price/cost analysis of subcontractor's proposal. If subcontract was not competed, include justification. _____

15. Forecast of monthly and cumulative dollar commitments for the proposed contract period. _____

h. Following is the Cost Element Summary required by Table of Contents Item 2. Cost elements which do not pertain to the Offeror's proposal may be omitted. Do not lump elements together. Cost elements peculiar to a particular Offeror which are not listed may be added. Elements may be rearranged to fit a Offeror's pricing structure.

COST ELEMENT SUMMARY

COST ELEMENTS	TOTAL DOLLARS
Direct Material	
Purchased Parts	
Subcontracts	
Other - Standard Commercial Items	
Computer Hardware, Software & Services	
Interdivisional Transfers	
Material Overhead	
Total Direct Labor	
Fringe Benefits	
Labor Overhead	
In-Plant	
On-Site	
Travel	
Consultants	
Other Direct Costs	
Supplies	
Publications	
Long Distance Telephone	
Reproduction	
Shipping & Postage	
General & Administrative (G&A) Expense	
Contract Facilities Capital Cost of Money	
Fee or Profit	
Total Proposed Contact Amount*	

*Arrange the elements and include spaces for subtotals which add up to the bottomline.

PART III

PROPOSAL EVALUATION

PART III - PROPOSAL EVALUATION

Proposals submitted in response to this BAA will be evaluated in accordance with the following criteria:

(1) The overall scientific and/or technical merits of the proposal.

(2) The potential contributions and/or transition of the effort to the Army simulation, training and instrumentation mission and the extent to which the research effort will contribute to high priority Army interests such as Future Combat Systems, (FCS).

(3) The offeror's capabilities, related experience, facilities, techniques, or unique combination of these which are integral factors for achieving the proposal objectives.

(4) The qualifications and experience of the proposed principal investigator, team leader, and other key personnel who are critical to the achievement of the proposal objectives.

(5) The reasonableness and realism of proposed costs and fees, if any, and the availability of funds.

Upon receipt of a proposal, the government evaluators will perform an initial review of its scientific merit and potential contribution to the Army mission and also determine if funds are expected to be available for the effort. Proposals not considered to have sufficient scientific merit or relevance to the Army's needs or those in areas for which funds are not expected to be available may be declined without further review.

It is the policy of RDECOM-STC, PEO-STRI, and ARI to treat all proposals as privileged information before award and to disclose the contents only for the purposes of evaluation. Proposals not declined as a result of initial review will be subject to an extensive peer review by highly qualified scientists from within the Government. The offeror must indicate on the appropriate proposal form any limitation to be placed on Disclosure of Information contained on the proposal.

Each proposal will be evaluated based on the merit and relevance of the specific research proposed as it relates to the overall RDECOM-STC, PEO-STRI, and ARI research program, rather than against other proposals for research in the same general area.

COOPERATIVE AGREEMENTS

PART IV - COOPERATIVE AGREEMENTS

The use of cooperative agreements has exciting advantages for both traditional defense contractors and non-defense oriented corporations. Many of the Army's modeling, simulation and instrumentation efforts have potential commercial applications. A cooperative agreement providing a military application may also result in a commercial application utilizing the same technology.

Title 10, United States Code Section 2358 provides authority to the Secretary of the Army to "engage in basic, advanced and applied research development projects" through the use of cooperative agreements.

The research and development project proposed under this authority must be necessary to the responsibilities of the Army and it must relate to a weapons system or other military need or be of potential interest to the Department of the Army.

Research and development projects under Section 2358 require that a purpose of the agreement is to transfer a thing of value to a private corporation or consortium of entities, to carry out a public purpose of support or stimulation authorized by law of the United States Government. In a cooperative agreement substantial government involvement is expected and required.

There are numerous implications in using a cooperative agreement that differentiate it from a procurement contract. The Competition In Contraction Act is not applicable in cooperative agreements. Instead, cooperative agreements are governed by the DoD Grants and Agreements Regulations (DODGARs).[1] The Federal Acquisition Regulation (FAR) is not applicable, unless portions of it are specifically incorporated into the cooperative agreement.

Cooperative agreements offer flexibility in the ability of the parties to fashion an agreement best suited to their unique circumstances. Special termination clauses providing termination rights for both parties, should the research and development not prove to be of benefit, can be part of the agreement.

Intellectual property provisions can be crafted to accommodate the Government's need for use of technical data for future competitive projects while protecting the contractor's ability to commercialize the product on an exclusive basis. The contractor obtains the rights to exclusively market and produce whatever may come out of the research and development in the commercial market. Inventions made under cooperative agreements are governed by Title 37 of the Code of Federal Regulation (CFR), Section 401.14, as amended. The CFR provides that the recipient of the cooperative agreement retains title to the invention while the government receives a royalty free non-exclusive license for government use. A cooperative agreement can also provide that joint inventions with government personnel will be jointly owned.

Agreements can utilize Alternative Dispute Resolution techniques to quickly resolve disagreements in a "win-win" manner for both parties. Creative problem solving is possible without the constraints of the Contract Disputes Acts.

[1] The DODGARS can be accessed at the DoD Regulation site, http://web7.whs.osd.mil/pdf/32106r/32106r.htm.

It cannot be stressed enough the importance of the leveraging of technology based dollars. As the defense sector downsizes, fewer and fewer dollars are available for research purposes. This cost sharing mechanism allows both parties to leverage technology based funds so as to create more where formerly there was less.

Further inquiries can be directed to Harlan Gottlieb, Chief Counsel at PEO-STRI, (407) 384-3513 or by email at Harlan_Gottlieb@peostri.army.mil. Technical questions can be directed to the Army employees listed earlier.

PART V

PROPOSAL FORMS

PART V - PROPOSAL FORMS

RESEARCH PROPOSAL COVER PAGE

1. To: Naval Air Warfare Center Training Systems Division Attn: TSD 25353 BAA Contracting Officer 12350 Research Parkway Orlando, FL 32826-3275	2. Research Area ☐ Training Technology & Methodology Research – Topic 2.1.__ ☐ Simulation Systems Research – Topic 2.2.__ ☐ Computer Applications Research – Topic 2.3.__ 3. Government Point of Contact During Technical Dialog
4. From *(name and address of offeror):*	5. Type and Size of Business: ☐ Large ☐ Small Business ☐ Individual ☐ SDB ☐ Partnership ☐ Women-Owned SB ☐ Corporation, incorporated in state of:

6. CAGE:	7. DUNS:	8. TIN:
9. Proposal Title:	10. Requested Start Date:	12. Total Proposed Contract Value:
	11. Requested Duration:	13. Proposal Valid Until (*minimum six months*):
14. Address to Which Payment Shall Be Mailed (*if different from Block 4*):	15. Type of Contract Proposed: ( ) Firm Fixed Price (<$100K) ( ) Cost Plus Fixed Fee ( ) Cost, No Fee ( ) Cost Sharing	16. Proposal Also Being Submitted to:

17. Offeror's technical representative authorized to conduct negotiations (Principal Investigator):		18. Offeror's administrative representative authorized to conduct negotiations:	
Name	Telephone No.	Name	Telephone No.
Primary		Primary	
Alternate		Alternate	

19. Proposal Contents (*if not applicable, enter "N/A" under Page*):

Page	Technical Section	Page	Administrative Section	Page	Cost Section
	Proposed Research		Contract Type		Detailed Cost Estimate Breakdown
	Potential Contribution		Organizational Conflicts of Interest		
	Offeror's Qualifications		Security Issues		DD Form 1861, Contract Facilities Capital Cost of Money (see Attachment (4))
	Personnel		Disclosure Preference and Evaluation Policy Understanding: Policy Statement, Statement of Disclosure Preference, and Statement of Understanding of Evaluation Policy (see Attachment (2))		
	Past Performance				
	Draft Description of Work				
			Representations, Certifications and Other Statements of Offerors or Quoters (see Attachment (3))		

20. Authorized Representative:

Typed Name: _____ Signature: _____

Title: _____ Date signed: _____

PROPOSAL COVER SHEET *(Cost or Pricing Data Not Required)*	1. SOLICITATION/CONTRACT/MODIFICATION NUMBER	

2a. NAME OF OFFEROR	3a. NAME OF OFFEROR'S POINT OF CONTACT	3c. TELEPHONE	
2b. FIRST LINE ADDRESS	3b. TITLE OF OFFEROR'S POINT OF CONTACT	AREA CODE	NUMBER
2c. STREET ADDRESS	3d. CAGE: CODE::	3e. FAX:	
	3f. DUNS No.:	3g. E-mail Address:	

2d. CITY AND COUNTY	2e. STATE	2f. ZIP CODE	4. TYPE OF CONTRACT *(Check)*			
				a. NEW CONTRACT		d. LETTER CONTRACT
5. TYPE OF CONTRACT *(Check)*				b. CHANGE ORDER		e. UNPRICED ORDER
☐ FFP ☐ CPFF ☐ CPIF ☐ CPAF				c. PRICE REVISION/ REDETERMINATION		f. OTHER *(Specify)*
☐ FPI ☐ OTHER *(Specify)*						

6. PERFORMANCE

PLACE(S)			PERIOD(S)		
	a.			a.	
	b.			b.	
	c.			c.	

7. List and reference the identification, quantity and total price proposed for each contract line item. *(Continue on reverse, if necessary. Use same headings.)*

a. LINE ITEM NO.	b. IDENTIFICATION	c. QUANTITY	d. TOTAL PRICE	e. PROP. REF. PAGE

8. PROVIDE THE FOLLOWING *(If available)*

NAME OF DEFENSE CONTRACT MANAGEMENT ADMINISTRATION OFFICE			NAME OF DEFENSE CONTRACT AUDIT AGENCY (DCAA) OFFICE		
STREET ADDRESS			STREET ADDRESS		
CITY	STATE	ZIP CODE	CITY	STATE	ZIP CODE
TELEPHONE / AREA CODE	NUMBER		TELEPHONE / AREA CODE	NUMBER	

This proposal is submitted in response to the solicitation, contract, modification, etc. in Item 1. By submitting this proposal, the offeror, if selected for discussions, grants the contracting officer and authorized representative the right to examine, at any time before award, any of those books, records, documents, or other records directly pertinent to the information requested or submitted.

9a. NAME OF OFFEROR *(Type)*	10. NAME OF FIRM
9b. TITLE OF OFFEROR *(Type)*	
11. SIGNATURE	18. DATE OF SUBMISSION

CONTRACT PRICING PROPOSAL COVER SHEET
(Cost or Pricing Data Required)

1. SOLICITATION/CONTRACT/MODIFICATION NUMBER

2a. NAME OF OFFEROR	3a. NAME OF OFFEROR'S POINT OF CONTACT	3c. TELEPHONE (AREA CODE / NUMBER)
2b. FIRST LINE ADDRESS	3b. TITLE OF OFFEROR'S POINT OF CONTACT	
2c. STREET ADDRESS	3d. FAX No:	
	3e. E-mail Address:	
2d. CITY AND COUNTY / 2e. STATE / 2f. ZIP CODE		

5. TYPE OF CONTRACT *(Check)*

☐ FFP ☐ CPFF ☐ CPIF ☐ CPAF

☐ FPI ☐ OTHER *(Specify)*

4. TYPE OF CONTRACT ACTION *(Check)*

☐	a. NEW CONTRACT	☐	d. LETTER CONTRACT
☐	b. CHANGE ORDER	☐	e. UNPRICED ORDER
☐	c. PRICE REVISION/ REDETERMINATION	☐	f. OTHER *(Specify)*

6. PROPOSED COST *(A+B=C)*

A. COST	B. PROFIT/FEE	C. TOTAL

7. PERFORMANCE

PLACE		PERIOD	
a.		a.	
b.		b.	

8. List and reference the identification, quantity and total price proposed for each contract line item. A line item cost breakdown supporting this recap is required unless otherwise specified by the Contracting Officer. *(Cont reverse, and then on plain paper, if necessary. Use same headings.)*

a. LINE ITEM NO.	b. IDENTIFICATION	c. QUANTITY	d. TOTAL PRICE	e. PROP. REF.

9. PROVIDE THE FOLLOWING *(If available)*

NAME OF DEFENSE CONTRACT MANAGEMENT ADMINISTRATION OFFICE	NAME OF DEFENSE CONTRACT AUDIT AGENCY (DCAA) OFFICE
STREET ADDRESS	STREET ADDRESS
CITY / STATE / ZIP CODE	CITY / STATE / ZIP CODE
TELEPHONE / AREA CODE / NUMBER	TELEPHONE / AREA CODE / NUMBER

10. WILL YOU REQUIRE THE USE OF ANY GOVERNMENT PROPERTY IN THE PERFORMANCE OF THIS WORK? *(If "Yes", identify)*
☐ YES ☐ NO

11. a. OFFEROR'S CAGE CODE:
b. OFFEROR'S DUNS NUMBER:

12. HAVE YOU BEEN AWARDED ANY CONTRACTS OR SUBCONTRACTS FOR THE SAME OR SIMILAR ITEMS WITHIN THE PAST 3 YEARS? *(If "Yes," identify item(s), customer(s), and contract number(s) on reverse of form).*
☐ YES ☐ NO

13. IS THIS PROPOSAL CONSISTENT WITH YOUR ESTABLISHED ESTIMATING AND ACCOUNTING PRACTICES AND PROCEDURES AND FAR PART 31, COST PRINCIPLES? *(If "no", explain on reverse form)*
☐ YES ☐ NO

14. COST ACCOUNTING STANDARDS BOARD (CASB) DATA *(Public Law 91-379 as amended and FAR PART 30)*

a. WILL THIS CONTRACT ACTION BE SUBJECT TO CASB REGULATIONS? *(If "No," explain in proposal)*
☐ YES ☐ NO

b. HAVE YOU SUBMITTED A CASB DISCLOSURE STATEMENT (CASB DS-1 or 2)? *(If "Yes," specify in proposal the office to which submitted and if determined to be adequate)*
☐ YES ☐ NO

c. HAVE YOU BEEN NOTIFIED THAT YOU ARE OR MAY BE IN NONCOMPLIANCE WITH YOUR DISCLOSURE STATEMENT OR COST ACCOUNTING STANDARDS? *(If "Yes", explain in proposal)*
☐ YES ☐ NO

d. IS ANY ASPECT OF THIS PROPOSAL INCONSISTENT WITH YOUR DISCLOSED PRACTICES OR APPLICABLE COST ACCOUNTING STANDARDS? *(If "Yes", explain in proposal)*
☐ YES ☐ NO

This proposal reflects our estimates and/or actual costs as of this date and conforms with the instructions in FAR 15.403-5(b)(1) and Table 15-2. By submitting this proposal, we grant the Contracting Officer and aut representative(s) the right to examine, at any time before award, those records, which include books, documents, accounting procedures and practices, and other data, regardless of type and form or whether such supporting info is specifically referenced or included in the proposal as the basis for pricing, that will permit an adequate evaluation of the proposed price.

15. NAME OF OFFEROR *(Type)*	15. TITLE OF OFFEROR *(Type)*	16. NAME OF FIRM

17. SIGNATURE	**18. DATE OF SUBMISSION**

DISCLOSURE OF PROPOSAL INFORMATION

POLICY STATEMENT

It is the policy of RDECOM-STC, PEO-STRI, and ARI research program, to treat all research proposals as privileged information before award and to disclose the contents only for purposes of evaluation. Technical evaluation of these proposals normally is made by highly qualified personnel from the Government.

All reviewers are made aware that proposals sent to them shall not be duplicated, used, or disclosed in whole or in part for any purpose other than to evaluate the proposal, without the written permission of the offeror.

You should be aware that, despite all precautions, we may be able to protect the confidentially of proposals only to the extent that they are exempt from disclosure under the Freedom of Information Act (see FAR 52.215-12).

Please complete the following statement indicating your preference for treatment of your disclosure.

STATEMENT OF DISCLOSURE PREFERENCE

(Institution or Company) in submitting proposal (Title) with (Name) as Principal Investigator require the following procedure be used during its evaluation:

( ) The data contained in this research proposal shall not be duplicated, used, or disclosed in whole or in part for any purpose, other than to evaluate the proposal, without the written permission of the offeror (except that if a contract is awarded on the basis of this proposal, the terms of the contract shall control disclosure and use). This restriction does not limit the Government's right to use information contained in the proposal if it is obtainable from another source without restriction. All data contained in this proposal are subject to this restriction.

( ) Permission is hereby granted to RDECOM-STC, and/or PEO-STRI, and/or ARI research program to evaluate this proposal, which may include evaluation by evaluators both within and outside the Government, with the understanding that written agreement not to disclose this information shall be obtained from any non-Government evaluator.

( ) The evaluation of the above proposal shall be restricted to government personnel only. The offeror shall mark the proposal in accordance with FAR 15.509.

(Date) (Signature of Authorized Company Representative)

(Date) (Signature of Principal Investigator)

POLICY STATEMENT AND
MEMORANDUM OF UNDERSTANDING

EVALUATION OF BROAD AGENCY ANNOUNCEMENTS

Prior to acceptance of any article of equipment, material, or disclosure of information for evaluation or testing by Army, the following policy must be understood and agreed to by the individual, firm, or corporation submitting such article, invention, or disclosure.

POLICY

1. The Army has a continuing interest in receiving and evaluating proposals containing new ideas, suggestions, and inventive concepts for weapons, supplies, facilities, devices, and equipment. However, Government personnel and contractors are constantly engaged in research and development activities, and the substance of the proposal may already be known to Government employees or contractors, or may even be in the public domain. For such reasons it is desirable, when receiving proposals for evaluation, to insure that the persons submitting them are aware of the conditions under which they will be considered by the Army.

2. It should be understood that the receipt and evaluation of the proposal by the Army does not imply a promise to pay, a recognition of novelty or originality, or any relationship which might require the government to pay for use of information to which it is otherwise lawfully entitled.

3. Due care will be exercised to ensure that, in addition to technical design or concept data submitted, financial and management plans will not be used by the Government for any purpose other than evaluation of the proposal.

4. The voluntary submissions will be handled in accordance with established Government procedures for safeguarding such articles or information against unauthorized disclosure. In addition, the data forming a part of or constituting the submission will not be disclosed outside the Government or be duplicated, used or disclosed in whole or in part by the Government, except for record purposes or to evaluate the proposal. This restriction extends to, and includes, financial and management plan information submitted with, or forming a part of this proposal. This restriction does not limit the Government's right to use information contained in such data if it is obtained from another source, or is in the public domain.

5. Information covering the results of evaluations or tests will be furnished to submitters upon request. Such information shall not be construed as an endorsement by the Government of articles or the subject matter of disclosure nor shall they be used in whole or in part for advertising purposes with industry or other Government agencies.

IT IS THE POLICY OF THE ARMY TO EVALUATE BAA PROPOSALS AS SOON AS POSSIBLE AFTER RECEIPT. THE CONDITIONS UNDER WHICH WE WILL RECEIVE AND EVALUATE SUBMISSIONS ARE PRESCRIBED BY REGULATION AND ARE OUTLINED IN THE ATTACHED STATEMENT OF POLICY. PLEASE EXECUTE AND RETURN A COPY OF THE ATTACHED MEMORANDUM OF UNDERSTANDING WITH YOUR PROPOSAL. UPON RECEIPT, YOUR PROPOSAL WILL BE SUBMITTED TO THE APPROPRIATE OFFICE FOR EVALUATION. ON COMPLETION OF THE EVALUATION, WHICH MAY REQUIRE AS MUCH AS 120 DAYS, YOU WILL BE INFORMED OF THIS AGENCY'S DECISION WITH RESPECT TO YOUR PROPOSAL.
YOU MAY BE ASSURED THAT YOUR SUBMISSION WILL BE GIVEN EVERY POSSIBLE CONSIDERATION FOR APPLICATION TO RDECOM-STC, PEO-STRI, and ARI REQUIREMENTS.

MEMORANDUM OF UNDERSTANDING

The undersigned who has read and understood the above policy, on behalf of (Individual, Company, or Corporation):
has made a disclosure of a proposal to the Army relating to_____It is understood that the Department of the Army has accepted the above proposal for the purpose of evaluating it and advising of any possible Army interest. It is further understood that such acceptance does not imply or create; a promise to pay; an obligation to give up any legal right or to assume any duty; a recognition of novelty, originality or priority; or any relationship, contractual or otherwise, such as would render the Government liable to pay for or give up any legal right or assume any obligation for disclosure or use of any information in the proposal to which the Government would otherwise lawfully be entitled.

Signature:
Printed/Typed Name:

Title/Position:

Date:

Reference: RDECOM-STC, PEO-STRI, and ARI BAA Number: N61339-01-R-0023

Title of Proposal:

_____

_____

REPRESENTATIONS, CERTIFICATIONS AND OTHER STATEMENTS OF OFFERORS OR QUOTERS

A. The following FAR provision must be completed ONLY if the proposed contract type is firm fixed price:

52.203-2 CERTIFICATE OF INDEPENDENT PRICE DETERMINATION (APR 1985)

(a) The offeror certifies that

(1) The prices in this offer have been arrived at independently, without, for the purpose of restricting competition, any consultation, communication, or agreement with any other offeror or competitor relating to (i) those prices, (ii) the intention to submit an offer, or (iii) the methods or factors used to calculate the prices offered;

(2) The prices in this offer have not been and will not be knowingly disclosed by the offeror, directly or indirectly, to any other offeror or competitor before bid opening (in the case of a sealed bid solicitation) or contract award (in the case of a negotiated solicitation) unless otherwise required by law; and

(3) No attempt has been made or will be made by the offeror to induce any other concern to submit or not to submit an offer for the purpose of restricting competition.

(b) Each signature on the offer is considered to be a certification by the signatory that the signatory

(1) Is the person in the offeror's organization responsible for determining the prices being offered in this bid or proposal, and that the signatory has not participated and will not participate in any action contrary to subparagraphs (a)(1) through (a)(3) above; or

(2)(i) Has been authorized, in writing, to act as agent for the following principals in certifying that those principals have not participated, and will not participate in any action contrary to subparagraphs (a)(1) through (a)(3) above _____
(insert full name of person(s) in the offeror's organization responsible for determining the prices offered in this bid or proposal, and the title of his or her position in the offeror's organization);

(ii) As an authorized agent, does certify that the principals named in subdivision (b)(2)(i) above have not participated, and will not participate, in any action contrary to subparagraphs (a)(1) through (a)(3) above; and

(iii) As an agent, has not personally participated, and will not participate, in any action contrary to subparagraphs (a)(1) through (a)(3) above.

(c) If the offeror deletes or modifies subparagraph (a)(2) above, the offeror must furnish with its offer a signed statement setting forth in detail the circumstances of the disclosure.

{end of provision}

B. The following DFARS provisions must be completed ONLY if the proposal is for supplies or services involving supplies:

252.225-7000 BUY AMERICAN ACT - BALANCE OF PAYMENTS PROGRAM CERTIFICATE (SEP 1999)

(a) *Definitions.* "Domestic end product," "qualifying country," "qualifying country end product," and "nonqualifying country end product" have the meanings given in the Buy American Act and Balance of Payments Program clause of this solicitation.

(b) *Evaluation.* Offers will be evaluated by giving preference to domestic end products and qualifying country end products over nonqualifying country end products.

(c) *Certifications.*

(1) The Offeror certifies that --

(i) Each end product, except those listed in paragraphs (c)(2) or (3) of this provision, is a domestic end product; and

(ii) Components of unknown origin are considered to have been mined, produced, or manufactured outside the United States or a qualifying country.

(2) The Offeror certifies that the following end products are qualifying country end products:

Qualifying Country End Products Line Item Number	Country of Origin
_____	_____
_____	_____
_____	_____

(List only qualifying country end products.)

(3) The Offeror certifies that the following end products are nonqualifying country end products:

Non-Qualifying Country End Products Line Item Number	Country of Origin (If Known)
_____	_____
_____	_____
_____	_____

{end of provision}

252.247-7022 REPRESENTATION OF EXTENT OF TRANSPORTATION BY SEA (AUG 1992)

(a) The Offeror shall indicate by checking the appropriate blank in paragraph (b) of this provision whether transportation of supplies by sea is anticipated under the resultant contract. The term "supplies" is defined in the Transportation of Supplies by Sea clause of this solicitation.

(b) Representation. The Offeror represents that it

☐ Does anticipate that supplies will be transported by sea in the performance of any contract or subcontract resulting from this solicitation.

☐ Does not anticipate that supplies will be transported by sea in the performance of any contract or subcontract resulting from this solicitation.

(c) Any contract resulting from this solicitation will include the Transportation of Supplies by Sea clause. If the Offeror represents that it will not use ocean transportation, the resulting contract will also include the Defense FAR Supplement clause at 252.247-7024, Notification of Transportation of Supplies by Sea.

C. The following FAR and DFARS provisions must be completed by ALL offerors.

52.203-11 CERTIFICATION AND DISCLOSURE REGARDING PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS (APR 1991)

(a) The definitions and prohibitions contained in the clause, at FAR 52.203-12, Limitation on Payments to Influence Certain Federal Transactions, included in this solicitation, are hereby incorporated by reference in paragraph (b) of this certification.

(b) The offeror, by signing its offer, hereby certifies to the best of his or her knowledge and belief that on or after December 23, 1989

(1) No Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress on his or her behalf in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment or modification of any Federal contract, grant, loan, or cooperative agreement;

(2) If any funds other than Federal appropriated funds (including profit or fee received under a covered Federal transaction) have been paid, or will be paid, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress on his or her behalf in connection with this solicitation, the offeror shall complete and submit, with its offer, OMB standard form LLL, Disclosure of Lobbying Activities, to the Contracting Officer; and

(3) He or she will include the language of this certification in all subcontract awards at any tier and require that all recipients of subcontract awards in excess of $100,000 shall certify and disclose accordingly.

(c) Submission of this certification and disclosure is a prerequisite for making or entering into this contract imposed by section 1352, title 31, United States Code. Any person who makes an expenditure prohibited under this provision or who fails to file or amend the disclosure form to be filed or amended by this provision, shall be subject to a civil penalty of not less than $10,000, and not more than $100,000, for each such failure.

{end of provision}

52.204-3 TAXPAYER IDENTIFICATION (OCT 1998)

(a) Definitions.

Common parent, as used in this provision, means that corporate entity that owns or controls an affiliated group of corporations that files its Federal income tax returns on a consolidated basis, and of which the offeror is a member.

Taxpayer Identification Number (TIN), as used in this provision, means the number required by the Internal Revenue Service (IRS) to be used by the offeror in reporting income tax and other returns. The TIN may be either a Social Security Number or an Employer Identification Number.

(b) All offerors must submit the information required in paragraphs (d) through (f) of this provision to comply with debt collection requirements of 31 U.S.C.7701(c) and 3325(d), reporting requirements of 26 U.S.C.6041, 6041A, and 6050M, and implementing regulations issued by the IRS. If the resulting contract is subject to the payment reporting requirements described in Federal Acquisition Regulation (FAR) 4.904, the failure or refusal by the offeror to furnish the information may result in a 31 percent reduction of payments otherwise due under the contract.

(c) The TIN may be used by the Government to collect and report on any delinquent amounts arising out of the offeror's relationship with the Government (31 U.S.C.7701(c)(3)). If the resulting contract is subject to the payment reporting requirements described in FAR 4.904, the TIN provided hereunder may be matched with IRS records to verify the accuracy of the offeror's TIN.

(d) Taxpayer Identification Number (TIN).

☐ TIN: _____
☐ TIN has been applied for.
☐ TIN is not required because:
☐ Offeror is a nonresident alien, foreign corporation, or foreign partnership that does not have income effectively connected with the conduct of a trade or business in the United States and does not have an office or place of business or a fiscal paying agent in the United States;
☐ Offeror is an agency or instrumentality of a foreign government;
☐ Offeror is an agency or instrumentality of the Federal Government.

(e) Type of organization.

☐ Sole proprietorship;
☐ Partnership;
☐ Corporate entity (not tax-exempt);
☐ Corporate entity (tax-exempt);
☐ Government entity (Federal, State, or local);
☐ Foreign government;
☐ International organization per 26 CFR 1.6049-4;
☐ Other _____

(f) Common parent.

☐ Offeror is not owned or controlled by a common parent as defined in paragraph (a) of this provision.
☐ Name and TIN of common parent:

Name _____

TIN _____

{end of provision}

52.204-5 WOMEN-OWNED BUSINESS (OTHER THAN SMALL BUSINESS) (MAY 1999)

(a) Definition. Women-owned business concern, as used in this provision, means a concern that is at least 51 percent owned by one or more women; or in the case of any publicly owned business, at least 51 percent of its stock is owned by one or more women; and whose management and daily business operations are controlled by one or more women.

(b) Representation. [Complete only if the offeror is a women-owned business concern and has not represented itself as a small business concern in paragraph (b)(1) of FAR 52.219-1, Small Business Program Representations, of this solicitation.] The offeror represents that it ☐ is a women-owned business concern.

{end of Provision}

52.204-6 DATA UNIVERSAL NUMBERING SYSTEM (DUNS) NUMBER (JUN 1999)

(a) The offeror shall enter, in the block with its name and address on the cover page of its offer, the annotation "DUNS" followed by the DUNS number that identifies the offeror's name and address exactly as stated in the offer. The DUNS number is a nine-digit number assigned by Dun and Bradstreet Information Services.

(b) If the offeror does not have a DUNS number, it should contact Dun and Bradstreet directly to obtain one. A DUNS number will be provided immediately by telephone at no charge to the offeror. For information on obtaining a DUNS number, the offeror, if located within the United States, should call Dun and Bradstreet at 1-800-333-0505. The offeror should be prepared to provide the following information:

(1) Company name.
(2) Company address.
(3) Company telephone number.
(4) Line of business.
(5) Chief executive officer/key manager.
(6) Date the company was started.

(7) Number of people employed by the company.
(8) Company affiliation.

(c) Offerors located outside the United States may obtain the location and phone number of the local Dun and Bradstreet Information Services office from the Internet home page at http://www.customerservice@dnb.com/. If an offeror is unable to locate a local service center, it may send an e-mail to Dun and Bradstreet at globalinfo@mail.dnb.com.

252.204-7001 COMMERCIAL AND GOVERNMENT ENTITY (CAGE) CODE REPORTING (AUG 1999)

(a) The offeror is requested to enter its CAGE code on its offer in the block with its name and address. The CAGE code entered must be for that name and address. Enter "CAGE" before the number.

(b) If the offeror does not have a CAGE code, it may ask the Contracting Officer to request one from the Defense Logistics Information Service (DLIS). The Contracting Officer will –

(1) Ask the Contractor to complete section B of a DD Form 2051, Request for Assignment of a Commercial and Government Entity (CAGE) Code;

(2) Complete section A and forward the form to DLIS; and

(3) Notify the Contractor of its assigned CAGE code.

(c) Do not delay submission of the offer pending receipt of a CAGE code.

{end of provision}

252.204-7004 REQUIRED CENTRAL CONTRACTOR REGISTRATION (MAR 1998)

(a) Definitions. As used in this clause --

(1) "Central Contractor Registration (CCR) database" means the primary DoD repository for contractor information required for the conduct of business with DoD.

(2) "Data Universal Number System (DUNS) number" means the 9-digit number assigned by Dun and Bradstreet Information Services to identify unique business entities.

(3) "Data Universal Numbering System +4 (DUNS+4) number" means the DUNS number assigned by Dun and Bradstreet plus a 4-digit suffix that may be assigned by a parent (controlling) business concern. This 4-digit suffix may be assigned at the discretion of the parent business concern for such purposes as identifying subunits or affiliates of the parent business concern.

(4) "Registered in the CCR database" means that all mandatory information, including the DUNS number or the DUNS+4 number, if applicable, and the corresponding Commercial and

Government Entity (CAGE) code, is in the CCR database; the DUNS number and the CAGE code have been validated; and all edits have been successfully completed.

(b)

(1) By submission of an offer, the offeror acknowledges the requirement that a prospective awardee must be registered in the CCR database prior to award, during performance, and through final payment of any contract resulting from this solicitation, except for awards to foreign vendors for work to be performed outside the United States.

(2) The offeror shall provide its DUNS or, if applicable, its DUNS+4 number with its offer, which will be used by the Contracting Officer to verify that the offeror is registered in the CCR database.

(3) Lack of registration in the CCR database will make an offeror ineligible for award.

(4) DoD has established a goal of registering an applicant in the CCR database within 48 hours after receipt of a complete and accurate application via the Internet. However, registration of an applicant submitting an application through a method other than the Internet may take up to 30 days. Therefore, offerors that are not registered should consider applying for registration immediately upon receipt of this solicitation.

(c) The Contractor is responsible for the accuracy and completeness of the data within the CCR, and for any liability resulting from the Government's reliance on inaccurate or incomplete data. To remain registered in the CCR database after the initial registration, the Contractor is required to confirm on an annual basis that its information in the CCR database is accurate and complete.

(d) Offerors and contractors may obtain information on registration and annual confirmation requirements by calling 1-888-227-2423, or via the Internet at http://ccr.edi.disa.mil.

{end of clause}

52.209-5 <u>CERTIFICATION REGARDING DEBARMENT, SUSPENSION, PROPOSED DEBARMENT, AND OTHER RESPONSIBILITY MATTERS (MAR 1996)</u>

(a) (1) The Offeror certifies, to the best of its knowledge and belief, that –

(i) The Offeror and/or any of its Principals --

(A) Are ☐ are not ☐ presently debarred, suspended, proposed for debarment, or declared ineligible for the award of contracts by any Federal agency;

(B) Have ☐ have not ☐, within a three-year period preceding this offer, been convicted of or had a civil judgment rendered against them for: commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, state, or local) contract or subcontract; violation of Federal or state antitrust statutes relating to the submission of offers; or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, tax evasion, or receiving stolen property; and

(C) Are ☐ are not ☐ presently indicted for, or otherwise criminally or civilly charged by a governmental entity with, commission of any of the offenses enumerated in subdivision (a)(1)(i)(B) of this provision.

(ii) The Offeror has ☐ has not ☐, within a three-year period preceding this offer, had one or more contracts terminated for default by any Federal agency.

(2) "Principals," for the purposes of this certification, means officers; directors; owners; partners; and, persons having primary management or supervisory responsibilities within a business entity (e.g., general manager; plant manager; head of a subsidiary, division, or business segment, and similar positions).

This Certification Concerns a Matter Within the Jurisdiction of an Agency of the United States and the Making of a False, Fictitious, or Fraudulent Certification May Render the Maker Subject to Prosecution Under Section 1001, Title 18, United States Code.

(b) The Offeror shall provide immediate written notice to the Contracting Officer if, at any time prior to contract award, the Offeror learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

(c) A certification that any of the items in paragraph (a) of this provision exists will not necessarily result in withholding of an award under this solicitation. However, the certification will be considered in connection with a determination of the Offeror's responsibility. Failure of the Offeror to furnish a certification or provide such additional information as requested by the Contracting Officer may render the Offeror nonresponsible.

(d) Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render, in good faith, the certification required by paragraph (a) of this provision. The knowledge and information of an Offeror is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

(e) The certification in paragraph (a) of this provision is a material representation of fact upon which reliance was placed when making award. If it is later determined that the Offeror knowingly rendered an erroneous certification, in addition to other remedies available to the Government, the Contracting Officer may terminate the contract resulting from this solicitation for default.

{end of provision}

252.209-7001 DISCLOSURE OF OWNERSHIP OR CONTROL BY THE GOVERNMENT OF A TERRORIST COUNTRY (MAR 1998)

(a) Definitions. As used in this provision --

(1) "Government of a terrorist country" includes the state and the government of a terrorist country, as well as any political subdivision, agency, or instrumentality thereof.

(2) "Terrorist country" means a country determined by the Secretary of State, under section

6(j)(1)(A) of the Export Administration Act of 1979 (50 U.S.C. App. 2405(j)(i)(A)), to be a country the government of which has repeatedly provided support for acts of international terrorism. As of the date of this provision, terrorist countries include: Cuba, Iran, Iraq, Libya, North Korea, Sudan, and Syria.

(3) "Significant interest" means --

(i) Ownership of or beneficial interest in 5 percent or more of the firm's or subsidiary's securities. Beneficial interest includes holding 5 percent or more of any class of the firm's securities in "nominee shares," "street names," or some other method of holding securities that does not disclose the beneficial owner;

(ii) Holding a management position in the firm, such as a director or officer;

(iii) Ability to control or influence the election, appointment, or tenure of directors or officers in the firm;

(iv) Ownership of 10 percent or more of the assets of a firm such as equipment, buildings, real estate, or other tangible assets of the firm; or

(v)Holding 50 percent or more of the indebtedness of a firm.

(b) Prohibition on award. In accordance with 10 U.S.C.2327, no contract may be awarded to a firm or a subsidiary of a firm if the government of a terrorist country has a significant interest in the firm or subsidiary or, in the case of a subsidiary, the firm that owns the subsidiary, unless a waiver is granted by the Secretary of Defense.

(c) Disclosure. If the government of a terrorist country has a significant interest in the Offeror or a subsidiary of the Offeror, the Offeror shall disclose such interest in an attachment to its offer. If the Offeror is a subsidiary, it shall also disclose any significant interest the government of a terrorist country has in any firm that owns or controls the subsidiary. The disclosure shall include --

(1) Identification of each government holding a significant interest; and

(2) A description of the significant interest held by each government.

{end of provision}

52.215-6 PLACE OF PERFORMANCE (OCT 1997)

(a) The offeror or respondent, in the performance of any contract resulting from this solicitation, ☐ intends, ☐ does not intend [check applicable block] to use one or more plants or facilities located at a different address from the address of the offeror or respondent as indicated in this proposal or response to request for information.

(b) If the offeror or respondent checks "intends" in paragraph (a) of this provision, it shall insert in the following spaces the required information:

Place of performance (Street address, City, County, State, Zip code)	Name and address of owner and operator of the plant or facility if other than offeror or quoter

{end of provision}

52.219-1 SMALL BUSINESS PROGRAM REPRESENTATIONS (OCT 2000) (ALTERNATE I – OCT 2000, ALTERNATE II – OCT 2000)

(a) (1) The North American Industry Classification System (NAICS) code for this acquisition is 541720.

(2) The small business size standard is $5M.

(3) The small business size standard for a concern which submits an offer in its own name, other than on a construction or service contract, but which proposes to furnish a product which it did not itself manufacture, is 500 employees.

(b) *Representations*.

(1) The offeror represents as part of its offer that it ☐ is, ☐ is not a small business concern.

(2) (Complete only if the offeror represented itself as a small business concern in paragraph (b)(1) of this provision.) The offeror represents, for general statistical purposes, that it ☐ is, ☐ is not, a small disadvantaged business concern as defined in 13 CFR 124.1002.

(3) (Complete only if the offeror represented itself as a small business concern in paragraph (b)(1) of this provision.) The offeror represents as part of its offer that it ☐ is, ☐ is not a women-owned small business concern.

(4) [Complete only if the offeror represented itself as a small business concern in paragraph (b)(1) of this provision.] The offeror represents as part of its offer that it ☐ is, ☐ is not a veteran-owned small business concern.

(5) [Complete only if the offeror represented itself as a veteran-owned small business concern in paragraph (b)(4) of this provision.] The offeror represents as part of its offer that it ☐ is, ☐ is not a service-disabled veteran-owned small business concern.

(6) [Complete only if offeror represented itself as a small business concern in paragraph (b)(1) of this provision.] The offeror represents, as part of its offer, that --

(i) It ☐ is, ☐ is not a HUBZone small business concern listed, on the date of this representation, on the List of Qualified HUBZone Small Business Concerns maintained

by the Small Business Administration, and no material change in ownership and control, principal office, or HUBZone employee percentage has occurred since it was certified by the Small Business Administration in accordance with 13 CFR Part 126; and

(ii) It ☐ is, ☐ is not a joint venture that complies with the requirements of 13 CFR Part 126, and the representation in paragraph (b)(6)(i) of this provision is accurate for the HUBZone small business concern or concerns that are participating in the joint venture. [The offeror shall enter the name or names of the HUBZone small business concern or concerns that are participating in the joint venture: _____.] Each HUBZone small business concern participating in the joint venture shall submit a separate signed copy of the HUBZone representation.

(7) [Complete if offeror represented itself as disadvantaged in paragraph (b)(2) of this provision.] The offeror shall check the category in which its ownership falls:

☐ Black American.
☐ Hispanic American.
☐ Native American (American Indians, Eskimos, Aleuts, or Native Hawaiians).
☐ Asian-Pacific American (persons with origins from Burma, Thailand, Malaysia, Indonesia, Singapore, Brunei, Japan, China, Taiwan, Laos, Cambodia (Kampuchea), Vietnam, Korea, The Philippines, U.S. Trust Territory of the Pacific Islands (Republic of Palau), Republic of the Marshall Islands, Federated States of Micronesia, the Commonwealth of the Northern Mariana Islands, Guam, Samoa, Macao, Hong Kong, Fiji, Tonga, Kiribati, Tuvalu, or Nauru).
☐ Subcontinent Asian (Asian-Indian) American (persons with origins from India, Pakistan, Bangladesh, Sri Lanka, Bhutan, the Maldives Islands, or Nepal).
☐ Individual/concern, other than one of the preceding.

(c) *Definitions.* As used in this provision --

Service-disabled veteran-owned small business concern --

(1) Means a small business concern --

(i) Not less than 51 percent of which is owned by one or more service-disabled veterans or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more service-disabled veterans; and

(ii) The management and daily business operations of which are controlled by one or more service-disabled veterans or, in the case of a veteran with permanent and severe disability, the spouse or permanent caregiver of such veteran.

(2) Service-disabled veteran means a veteran, as defined in 38 U.S.C.101(2), with a disability that is service-connected, as defined in 38 U.S.C.101(16).

"Small business concern," means a concern, including its affiliates, that is independently owned and operated, not dominant in the field of operation in which it is bidding on Government contracts, and qualified as a small business under the criteria in 13 CFR Part 121 and the size standard in paragraph (a) of this provision.

Veteran-owned small business concern means a small business concern --

(1) Not less than 51 percent of which is owned by one or more veterans (as defined at 38 U.S.C.101(2)) or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more veterans; and

(2) The management and daily business operations of which are controlled by one or more veterans.

"Women-owned small business concern," means a small business concern --

(1) Which is at least 51 percent owned by one or more women or, in the case of any publicly owned business, at least 51 percent of the stock of which is owned by one or more women; and

(2) Whose management and daily business operations are controlled by one or more women.

(d) *Notice*.

(1) If this solicitation is for supplies and has been set aside, in whole or in part, for small business concerns, then the clause in this solicitation providing notice of the set-aside contains restrictions on the source of the end items to be furnished.

(2) Under 15 U.S.C.645(d), any person who misrepresents a firm's status as a small, HUBZone small, small disadvantaged, or women-owned small business concern in order to obtain a contract to be awarded under the preference programs established pursuant to section 8(a), 8(d), 9, or 15 of the Small Business Act or any other provision of Federal law that specifically references section 8(d) for a definition of program eligibility, shall --

(i) Be punished by imposition of fine, imprisonment, or both;
(ii) Be subject to administrative remedies, including suspension and debarment; and
(iii) Be ineligible for participation in programs conducted under the authority of the Act.

{end of provision}

52.222-22 PREVIOUS CONTRACTS AND COMPLIANCE REPORTS (FEB 1999)

The offeror represents that –

(a) It ☐ has, ☐ has not participated in a previous contract or subcontract subject to the Equal Opportunity clause of this solicitation;

(b) It ☐ has, ☐ has not filed all required compliance reports; and

(c) Representations indicating submission of required compliance reports, signed by proposed subcontractors, will be obtained before subcontract awards.16.

{end of provision}

52.222-25 AFFIRMATIVE ACTION COMPLIANCE (APR 1984)

The offeror represents that (a) it ☐ has developed and has on file, ☐ has not developed and does not have on file, at each establishment, affirmative action programs required by the rules and regulations of the Secretary of Labor (41 CFR 60-1 and 60-2), or (b) it ☐ has not previously had contracts subject to the written affirmative action programs requirement of the rules and regulations of the Secretary of Labor.

{end of provision}

52.223-13 CERTIFICATION OF TOXIC CHEMICAL RELEASE REPORTING (OCT 2000)

(a) Submission of this certification is a prerequisite for making or entering into this contract imposed by Executive Order 12969, August 8, 1995.

(b) By signing this offer, the offeror certifies that --

(1) As the owner or operator of facilities that will be used in the performance of this contract that are subject to the filing and reporting requirements described in section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) (42 U.S.C.11023) and section 6607 of the Pollution Prevention Act of 1990 (PPA) (42 U.S.C.13106), the offeror will file and continue to file for such facilities for the life of the contract the Toxic Chemical Release Inventory Form (Form R) as described in sections 313(a) and (g) of EPCRA and section 6607 of PPA; or

(2) None of its owned or operated facilities to be used in the performance of this contract is subject to the Form R filing and reporting requirements because each such facility is exempt for at least one of the following reasons: [Check each block that is applicable.]

☐ (i) The facility does not manufacture, process, or otherwise use any toxic chemicals listed under section 313(c) of EPCRA, 42 U.S.C.11023(c);

☐ (ii) The facility does not have 10 or more full-time employees as specified in section 313(b)(1)(A) of EPCRA, 42 U.S.C.11023(b)(1)(A);

☐ (iii) The facility does not meet the reporting thresholds of toxic chemicals established under section 313(f) of EPCRA, 42 U.S.C.11023(f) (including the alternate thresholds at 40 CFR 372.27, provided an appropriate certification form has been filed with EPA);

☐ (iv) The facility does not fall within Standard Industrial Classification Code (SIC) major groups 20 through 39 or their corresponding North American Industry Classification System (NAICS) sectors 31 through 33; or

☐ (v) The facility is not located within any State of the United States, the District of Columbia, the Commonwealth of Puerto Rico, Guam, American Samoa, the United States Virgin Islands, the Northern Mariana Islands, or any other territory or possession over which the United States has jurisdiction.

{end of provision}

52.226-2 HISTORICALLY BLACK COLLEGE OR UNIVERSITY AND MINORITY INSTITUTION REPRESENTATION (MAY 1997)

(a) *Definitions*. As used in this provision –

"Historically Black College or University" means an institution determined by the Secretary of Education to meet the requirements of 34 CFR 608.2. For the Department of Defense, the National Aeronautics and Space Administration, and the Coast Guard, the term also includes any nonprofit research institution that was an integral part of such a college or university before November 14, 1986.

"Minority Institution" means an institution of higher education meeting the requirements of Section 1046(3) of the Higher Education Act of 1965 (20 U.S.C.1135d-5(3)) which, for the purpose of this provision, includes a Hispanic-serving institution of higher education as defined in Section 316(b)(1) of the Act (20 U.S.C.1059c(b)(1)).

(b) *Representation*. The offeror represents that it --

☐ is ☐ is not a Historically Black College or University;
☐ is ☐ is not a Minority Institution.

{end of provision}

52.227-6 ROYALTY INFORMATION (APR 1984)

(a) *Cost or charges for royalties.* When the response to this solicitation contains costs or charges for royalties totaling more than $250, the following information shall be included in the response relating to each separate item of royalty or license fee:

(1) Name and address of licensor.
(2) Date of license agreement.
(3) Patent numbers, patent application serial numbers, or other basis on which the royalty is payable.
(4) Brief description, including any part or model numbers of each contract item or component on which the royalty is payable.
(5) Percentage or dollar rate of royalty per unit.
(6) Unit price of contract item.
(7) Number of units.
(8) Total dollar amount of royalties.

(b) *Copies of current licenses.* In addition, if specifically requested by the Contracting Officer before execution of the contract, the offeror shall furnish a copy of the current license agreement and an identification of applicable claims of specific patents.

{end of provision}

252.227-7017 IDENTIFICATION AND ASSERTION OF USE, RELEASE, OR DISCLOSURE RESTRICTIONS (JUN 1995)

(a) The terms used in this provision are defined in following clause or clauses contained in this solicitation --

(1) If a successful offeror will be required to deliver technical data, the Rights in Technical Data -- Noncommercial Items clause, or, if this solicitation contemplates a contract under the Small Business Innovative Research Program, the Rights in Noncommercial Technical Data and Computer Software -- Small Business Innovative Research (SBIR) Program clause.

(2) If a successful offeror will not be required to deliver technical data, the Rights in Noncommercial Computer Software and Noncommercial Computer Software Documentation clause, or, if this solicitation contemplates a contract under the Small Business Innovative Research Program, the Rights in Noncommercial Technical Data and Computer Software -- Small Business Innovative Research (SBIR) Program clause.

(b) The identification and assertion requirements in this provision apply only to technical data, including computer software documentation, or computer software to be delivered with other than unlimited rights. For contracts to be awarded under the Small Business Innovative Research Program, the notification and identification requirements do not apply to technical data or computer software that will be generated under the resulting contract. Notification and identification is not required for restrictions based solely on copyright.

(c) Offers submitted in response to this solicitation shall identify, to the extent known at the time an offer is submitted to the Government, the technical data or computer software that the Offeror, its subcontractors or suppliers, or potential subcontractors or suppliers, assert should be furnished to the Government with restrictions on use, release, or disclosure.

(d) The Offeror's assertions, including the assertions of its subcontractors or suppliers or potential subcontractors or suppliers, shall be submitted as an attachment to its offer in the following format, dated and signed by an official authorized to contractually obligate the Offeror:

- Identification and Assertion of Restrictions on the Government's Use, Release, or Disclosure of Technical Data Computer Software.

- The Offeror asserts for itself, or the persons identified below, that the Government's rights to use, release, or disclose the following technical data or computer software should be restricted:

Technical Data Computer Software to be Furnished With Restrictions*	**Basis for Assertion****	**Asserted Rights Category*****	**Name of Person Asserting Restrictions********
[LIST]*********	[LIST]	[LIST]	[LIST]

* For technical data (other than computer software documentation) pertaining to items, components, or processes developed at private expense, identify both the deliverable technical data and each such item, component, or process. For computer software or computer software documentation identify the software or documentation.

** Generally, development at private expense, either exclusively or partially, is the only basis for asserting restrictions. For technical data, other than computer software documentation, development refers to development of the item, component, or process to which the data pertain. The Government's rights in computer software documentation generally may not be restricted. For computer software, development refers to the software. Indicate whether development was accomplished exclusively or partially at private expense. If development was not accomplished at private expense, or for computer software documentation, enter the specific basis for asserting restrictions.

*** Enter asserted rights category (e.g., government purpose license rights from a prior contract, rights in SBIR data generated under another contract, limited, restricted, or government purpose rights under this or a prior contract, or specially negotiated licenses).

**** Corporation, individual, or other person, as appropriate.

***** Enter "none" when all data or software will be submitted without restrictions.

Date _____

Printed Name and Title _____

_____

Signature _____

(End of identification and assertion)

(e) An offeror's failure to submit, complete, or sign the notification and identification required by paragraph (d) of this provision with its offer may render the offer ineligible for award.

(f) If the Offeror is awarded a contract, the assertions identified in paragraph (d) of this provision shall be listed in an attachment to that contract. Upon request by the Contracting Officer, the Offeror shall provide sufficient information to enable the Contracting Officer to evaluate any listed assertion.

{end of provision}

252.227-7028 TECHNICAL DATA OR COMPUTER SOFTWARE PREVIOUSLY DELIVERED TO THE GOVERNMENT (JUN 1995)

The Offeror shall attach to its offer an identification of all documents or other media incorporating technical data or computer software it intends to deliver under this contract with other than unlimited rights that are identical or substantially similar to documents or other media that the Offeror has produced for, delivered to, or is obligated to deliver to the Government under any contract or subcontract. The attachment shall identify --

(a) The contract number under which the data or software were produced;

(b) The contract number under which, and the name and address of the organization to whom, the data or software were most recently delivered or will be delivered; and

(c) Any limitations on the Government's rights to use or disclose the data or software, including, when applicable, identification of the earliest date the limitations expire.

{end of provision}

52.230-1 COST ACCOUNTING STANDARDS NOTICES AND CERTIFICATION (JULY 2000)

Note: This notice does not apply to small businesses or foreign governments. This notice is in three parts, identified by Roman numerals I through III.

Offerors shall examine each part and provide the requested information in order to determine Cost Accounting Standards (CAS) requirements applicable to any resultant contract.

If the offeror is an educational institution, Part II does not apply unless the contemplated contract will be subject to full or modified CAS coverage pursuant to 48 CFR 9903.201-2(c)(5) or 9903.201-2(c)(6), respectively.

I. *Disclosure Statement* -- Cost Accounting Practices and Certification

(a) Any contract in excess of $500,000 resulting from this solicitation will be subject to the requirements of the Cost Accounting Standards Board (48 CFR Chapter 99), except for those contracts which are exempt as specified in 48 CFR 9903.201-1.

(b) Any offeror submitting a proposal which, if accepted, will result in a contract subject to the requirements of 48 CFR Chapter 99 must, as a condition of contracting, submit a Disclosure Statement as required by 48 CFR 9903.202. When required, the Disclosure Statement must be submitted as a part of the offeror's proposal under this solicitation unless the offeror has already submitted a Disclosure Statement disclosing the practices used in connection with the pricing of this proposal. If an applicable Disclosure Statement has already been submitted, the offeror may satisfy the requirement for submission by providing the information requested in paragraph (c) of Part I of this provision.

Caution: In the absence of specific regulations or agreement, a practice disclosed in a Disclosure Statement shall not, by virtue of such disclosure, be deemed to be a proper, approved, or agreed-to practice for pricing proposals or accumulating and reporting contract performance cost data.

(c) *Check the appropriate box below:*

☐ (1) *Certificate of Concurrent Submission of Disclosure Statement.* The offeror hereby certifies that, as a part of the offer, copies of the Disclosure Statement have been submitted as follows:

(i) Original and one copy to the cognizant Administrative Contracting Officer (ACO) or cognizant Federal agency official authorized to act in that capacity (Federal official), as applicable; and

(ii) One copy to the cognizant Federal auditor.

(Disclosure must be on Form No. CASB DS-1 or CASB DS-2, as applicable. Forms may be obtained from the cognizant ACO or Federal official and/or from the loose-leaf version of the Federal Acquisition Regulation.)

Date of Disclosure Statement: _____
Name and Address of Cognizant ACO or Federal Official Where Filed:

_____
_____
_____

The offeror further certifies that the practices used in estimating costs in pricing this proposal are consistent with the cost accounting practices disclosed in the Disclosure Statement.

☐ (2) *Certificate of Previously Submitted Disclosure Statement.* The offeror hereby certifies that the required Disclosure Statement was filed as follows:

Date of Disclosure Statement: _____
Name and Address of Cognizant ACO or Federal Official Where Filed:
_____
_____
_____

The offeror further certifies that the practices used in estimating costs in pricing this proposal are consistent with the cost accounting practices disclosed in the applicable Disclosure Statement.

☐ (3) *Certificate of Monetary Exemption.* The offeror hereby certifies that the offeror, together with all divisions, subsidiaries, and affiliates under common control, did not receive net awards of negotiated prime contracts and subcontracts subject to CAS totaling more than $50 million or more in the cost accounting period immediately preceding the period in which this proposal was submitted. The offeror further certifies that if such status changes before an award resulting from this proposal, the offeror will advise the Contracting Officer immediately.

☐ (4) *Certificate of Interim Exemption.* The offeror hereby certifies that

(i) the offeror first exceeded the monetary exemption for disclosure, as defined in (3) of this subsection, in the cost accounting period immediately preceding the period in which this offer was submitted and

(ii) in accordance with 48 CFR 9903.202-1, the offeror is not yet required to submit a Disclosure Statement. The offeror further certifies that if an award resulting from this proposal has not been made within 90 days after the end of that period, the offeror will immediately submit a revised certificate to the Contracting Officer, in the form specified under subparagraph (c)(1) or (c)(2) of Part I of this provision, as appropriate, to verify submission of a completed Disclosure Statement.

Caution: Offerors currently required to disclose because they were awarded a CAS-covered prime contract or subcontract of $50 million or more in the current cost accounting period may not claim this exemption (4). Further, the exemption applies only in connection with proposals submitted before expiration of the 90-day period following the cost accounting period in which the monetary exemption was exceeded.

II. *Cost Accounting Standards -- Eligibility for Modified Contract Coverage*

☐ The offeror hereby claims an exemption from the Cost Accounting Standards clause under the provisions of 48 CFR 9903.201-2(b) and certifies that the offeror is eligible for use of the Disclosure and Consistency of Cost Accounting Practices clause because during the cost accounting period immediately preceding the period in which this proposal was submitted, the offeror received less than $50 million in awards of CAS-covered prime contracts and subcontracts. Checking the box below shall mean that the resultant contract is subject to the

Disclosure and Consistency of Cost Accounting Practices clause in lieu of the Cost Accounting Standards clause.

☐ *The offeror hereby claims an exemption from the Cost Accounting Standards clause under the provisions of 48 CFR 9903.201-2(b) and certifies that the offeror is eligible for use of the Disclosure and Consistency of Cost Accounting Practices clause because during the cost accounting period immediately preceding the period in which this proposal was submitted, the offeror received less than $25 million in awards of CAS-covered prime contracts and subcontracts, or the offeror did not receive a single CAS-covered award exceeding $1 million. The offeror further certifies that if such status changes before an award resulting from this proposal, the offeror will advise the Contracting Officer immediately.*

Caution: An offeror may not claim the above eligibility for modified contract coverage if this proposal is expected to result in the award of a CAS-covered contract of $50 million or more or if, during its current cost accounting period, the offeror has been awarded a single CAS-covered prime contract or subcontract of $50 million or more.

III. *Additional Cost Accounting Standards Applicable to Existing Contracts*

The offeror shall indicate below whether award of the contemplated contract would, in accordance with subparagraph (a)(3) of the Cost Accounting Standards clause, require a change in established cost accounting practices affecting existing contracts and subcontracts.

☐ yes ☐ no

{end of provision}

CONTRACT FACILITIES CAPITAL COST OF MONEY

Form Approved
OMB No. 0704-0267
Expires Feb 28, 1993

The public reporting burden for this collection of information is estimated to average 10 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0267) , 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be award that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

PLEASE DO NOT RETURN YOUR COMPLETED FORM TO THIS ADDRESS.
RETURN COMPLETED FORM TO YOUR CONTRACTING OFFICIAL.

1. CONTRACTOR NAME	2. CONTRACTOR ADDRESS
3. BUSINESS UNIT	
4. RFP/CONTRACT PIIN NUMBER	5. PERFORMANCE PERIOD

6. DISTRIBUTION OF FACILITIES CAPITAL COST OF MONEY

POOL a.	ALLOCATION BASE b.	FACILITIES CAPITAL COST OF MONEY c.	
		FACTOR (1)	AMOUNT (2)
d. TOTAL			
e. TREASURY RATE			%
f. FACILITIES CAPITAL EMPLOYED (TOTAL DIVIDED BY TREASURY RATE)			

7. DISTRIBUTION OF FACILITIES CAPITAL EMPLOYED

	PERCENTAGE a.	AMOUNT b.
(1) LAND	%	
(2) BUILDINGS	%	
(3) EQUIPMENT	%	
(4) FACILITIES CAPITAL EMPLOYED	100%	

APPENDIX A

RDECOM-STC/PEO-STRI/ARI BAA Schedule
New Starts: Obligating Early within New Fiscal Year